UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 1
5 POST OFFICE SQUARE, SUITE 100
BOSTON, MA 02109-3912

URGENT LEGAL MATTER – PROMPT REPLY NECESSARY
CERTIFIED MAIL – RETURN RECEIPT REQUESTED

JUL 0 6 2016

Richard Stavis
Chief Executive Officer
Stavis Seafoods, Inc.
212 Northern Avenue, Suite 305
Boston, MA 02210

Mary Fleming
Chief Financial Officer
Stavis Seafoods, Inc.
212 Northern Avenue, Suite 305
Boston, MA 02210

Re: Notice of Potential Violations Pursuant to Section 112(r) of the Clean Air Act and Request for Information Issued Pursuant to Section 114(a)(1) of the Clean Air Act, Section 3007 of the Resource Conservation and Recovery Act, and Section 104(e) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980

Dear Mr. Stavis and Ms. Fleming:

On March 24, 2016, representatives of the United States Environmental Protection Agency, Region 1 ("EPA") conducted an inspection at the Stavis Seafoods, Inc. ("Stavis") facility located at 7 Channel Street in Boston, Massachusetts. Representatives from the Occupational Safety and Health Administration ("OSHA"), Boston Fire Department ("BFD"), Massachusetts Department of Public Safety ("DPS"), and Massachusetts Department of Public Health, among others, also attended. The inspection followed an ammonia release at the facility, which had occurred the previous day, resulting in the death of an employee. The purpose of EPA's inspection was to determine whether the company was in compliance with various environmental statutes administered by EPA, including Sections 302-312 of the Emergency Planning and Community Right-To-Know Act ("EPCRA"), Section 112(r) of the Clean Air Act ("CAA"), and Section 103 of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA").

The inspection revealed numerous dangerous conditions, including, but not limited to problems associated with the facility's refrigeration system, which cycles anhydrous ammonia through various stages to cool and freeze seafood. Anhydrous ammonia has many environmental and operational benefits, but its use requires great care due to its toxicity and the chemical's flammability at certain vapor concentrations.

Given the death and number of dangerous conditions at the facility, EPA hired an ammonia refrigeration expert with approximately 30 years of experience to accompany EPA on a second inspection. This second inspection occurred on April 6, 2016. The expert confirmed the existence of several dangerous conditions that require immediate work and developed, for EPA's consideration, a list of recommended critical action items, enclosed in Attachment 2.[1]

Some of the dangerous conditions observed during the inspections include the following:

- It is questionable whether some pieces of equipment and piping are fit for service and thus require testing before reuse. For example, several pressure vessels do not have a "U" or "UM" stamp, are not listed by an approved nationally recognized testing lab, or are not otherwise documented as meeting the design, fabrication, and testing requirements of the ASME Boiler and Pressure Vessel Code. Also, the nameplate on the transfer ("dump") tank is missing. Likewise, some vessels and piping are covered with failing or deficient vapor barriers, so it is unclear whether they have been protected from moisture and corrosion sufficiently to be fit for continued use.
- The oil separator pressure vessels have no pressure relief protection to prevent catastrophic blow outs in the event of fire or other incidents. Existing pressure relief valves on other pressure vessels in the system are not tagged to indicate the date of installation or date of last inspection, and the facility has been unable to produce any information about when the valves were installed or tested.
- Areas in the facility containing significant quantities of ammonia, including the ammonia machinery room ("AMR"), do not have an audio and visual alarm system to warn personnel in the event of an ammonia release. Although there appears to be a visual alarm light outside the primary entrance to the AMR building, it is not adequately labeled to identify its purpose.
- The layout of the AMR does not provide safe access to equipment. The space is very cramped and lacks clear, unobstructed spaces for inspection, service, maintenance, and emergency shutdown of equipment in many instances. There is inadequate lighting in the room. Also, there is only one means of egress, and it is across the room from the receivers and down a set of wooden stairs (which could be unusable in the event of a fire). Further, a set of doors on the second floor opens to the exterior of the building, but no landing or stairs down are provided. This could present a major danger to workers or emergency responders attempting to rapidly exit the area during an emergency.
- Ammonia piping, valves, and other system components are not adequately safeguarded to protect from accidental damage or rupture by external sources. For example, multiple oil drain lines on pressure vessels extended from the tanks into walkways and were not protected from potential impact.
- The AMR, located on the second floor, is not properly isolated from the first floor maintenance room. The doors into the AMR are not tight-fitting and self-closing, and the AMR walls contain holes and gaps for piping and conduit that are not sealed from other spaces in the building.

[1] This list of recommended critical action items was also previously emailed to you and your representatives on June 21, 2016.

- The only door entering the AMR building lacks adequate labeling; it fails to warn of the hazards of entering a room with ammonia-containing machinery, restrict access to authorized personnel, provide appropriate information about alarms, and post emergency procedures.
- There is no safe way to access ammonia-containing equipment on the roof or to leave the roof, which can only be accessed by an unsecured ladder placed precariously near the wooden steps leading down to the first floor of the building. Also, the roof does not have guardrails installed or any other method of fall protection to protect personnel working near the roof edge.
- The pilot receiver's oil drain valve is not self-closing. This could significantly increase the risk of an ammonia release from this vessel during oil draining procedures and escalate the consequences of such a release, were one to occur.
- Although an emergency ventilation system for the AMR is present, it does not appear to be working, as the air intake louvers in the AMR did not open during the March 23rd, 2016 release. Without adequate ventilation, ammonia vapors could build up to dangerous levels during a release. Also, the emergency ventilation exhaust discharge point is less than 20 feet from the property line, which could further endanger neighboring businesses and the general public in the event of a release.
- The link between the AMR ammonia detector and the ventilation system and automatic equipment shutdown was manually bypassed in January 2016 and never re-activated. This means that, although the detectors detected high levels of ammonia, the M&M system would not have automatically turned on the emergency ventilation, shut down the compressors, and activated the alarm. The M&M control system also appears to be improperly calibrated, as the time of day displayed is incorrect. Also, it appears that the ammonia detectors have not been calibrated since January 2015, even though the manufacturer recommends bump tests at least every six months and re-calibration at least annually.
- The emergency shutdown valve on the Control Pressure Receiver is not accessible. Also, emergency shutdown valves for the system are not adequately labeled.
- A significant amount of ammonia-containing piping and equipment in the AMR, on the roof, and in other areas is not adequately labeled to indicate the contents, pressure, physical state, and direction of flow. Also, most of the natural gas piping at the facility was not labeled, even though some were located right next to ammonia piping and in some instances were painted the same color as ammonia piping, which could confuse workers and emergency responders.
- There is one locked remote control box for shutting down the equipment in the AMR and for starting a ventilation fan in the case of a release, but the switches do not have clearly marked signage about their function. The key to the remote control box was not easily accessible by emergency responders during the March 23rd release. Also, given that the control box is downstairs outside the entrance to the building and the AMR is on the second floor, people in the AMR would have difficulty accessing the controls in an emergency situation. Finally, the remote control for shutting down the equipment does not appear to power off all

equipment in the AMR, as an air compressor turned on during EPA's March 24th inspection.

- The facility does not have proper eyewash/shower stations inside or immediately outside the AMR. There is an eyewash station (but no safety shower) at the bottom of the wooden stairs below the AMR, but it is not easily accessible by personnel working upstairs in the AMR. Also, it does not appear to be plumbed to an adequate water source.
- There is excessive corrosion, ice buildup, and vapor barrier failure on some piping, valves, vessels, and other equipment in the system. Some vapor barriers were of a type that holds water and that can therefore cause corrosion.
- There are multiple fire hazards and combustible items in the AMR building, including exposed electrical wiring, multiple combustible/flammable items stored in the first floor maintenance room, a wooden staircase, and an electrical conduit that was observed to be dripping water.
- The facility does not have adequate documentation on site about the technology and equipment in the system. For example, the process and instrumentation diagram posted in the AMR does not include some key process equipment located in that room. Also, the facility could not produce calculations to demonstrate that the pressure relief vent header or the AMR ventilation were adequate. Nor could the Facility produce documentation about maintenance of the system and/or its preventative maintenance plan.
- The facility has not conducted a hazard analysis/review to identify all of the hazards associated with the system.

There are other problems with the ammonia refrigeration system and with the company's compliance with environmental laws. These problems are set forth in the attached chart of potential Clean Air Act Section 112(r) violations (Attachment 1) and in the inspection reports and expert report (Attachment 2). These documents may be subject to further revision as EPA obtains more information.

In his professional opinion, as set forth in Attachment 2, the expert hired by EPA believes that the refrigeration system should have the ammonia pumped out under negative pressure and the oil fully removed; that the system should be shut down until the critical items he identified have been addressed; that a schedule to fix the critical items should be developed immediately; that the critical items should be addressed before the system is restarted; and that the repairs could take one to three months to complete.

Accordingly, one purpose of this letter to is to provide you with early notice that, as soon as possible, EPA plans to issue a Clean Air Act compliance order ("Order") to Stavis. The Order will require compliance with Clean Air Act Section 112(r)'s General Duty Clause.[2] Pursuant to the General Duty Clause, found at Section 112(r)(1) of the Act, 42 U.S.C. § 7412(r)(1), owners and operators of stationary sources producing, processing, handling, or storing substances listed

[2] The General Duty Clause applies, rather than the Risk Management Plan rules at 40 C.F.R. Part 68, because the refrigeration system contained less than 10,000 pounds of ammonia, as confirmed by EPA's expert. He calculated that it contained about 7,000 pounds of ammonia.

pursuant to Section 112(r)(3) of the Clean Air Act, 42 U.S.C. § 7412(r)(3),[3] or any other extremely hazardous substance, have a general duty to:

a. identify hazards which may result from accidental releases of such substances, using appropriate hazard assessment techniques;
b. design and maintain a safe facility taking such steps as are necessary to prevent releases; and
c. minimize the consequences of accidental releases which do occur.[4]

The Order will have tight deadlines, but it will take EPA some time to issue it. Accordingly, because of the dangerous nature of these conditions and in order to provide you with as much time as possible to act, with this letter, EPA is giving you advanced notice about the likely contents of the Order. The Order will cite violations of all three duties of the General Duty Clause (see above) and require compliance with those duties. The attached chart, entitled Notice of Potential Violations, explains how conditions at the facility may give rise to General Duty Clause violations. The main requirements of the Order likely will be as follows:

a. Hire professional qualified contractors to help Stavis comply with the Order. The contractors will need expertise in designing ammonia refrigeration systems, conducting process hazard reviews, and conducting non-destructive testing of piping and other system components. The team must be fully conversant with the industry codes and standards that apply to ammonia refrigeration facilities. You should share this letter, the attached reports, and photos with the team.
b. Assemble a comprehensive set of process and instrumentation diagrams ("P&IDs"), signed by a professional engineer, in preparation for performing a hazard review of the system and addressing the hazards.
c. Safely remove all ammonia under negative pressure, remove all oil, and shut down the system while critical action items are being addressed.
d. Conduct non-destructive testing on the system's components and piping, and conduct penetrant testing on the nipple weld on the pilot receiver where the line break occurred.
e. Verify and certify that, in accordance with appropriate industry codes and standards,
    1. all pressure vessels in the system are fit for service;
    2. all small bore (less than two-inch) ammonia piping is schedule 80 and fit for service;
    3. pressure vessel pressure relief, relief vent header, and ventilation calculations demonstrate that each is appropriate for the system; and
    4. ammonia detectors are appropriately installed, calibrated, and tied in to AMR equipment remote shutdown capabilities, ventilation, and audio/visual alarms.
f. Conduct a process hazard analysis/review ("Hazard Review") of the system to understand the hazards associated with the system. The purpose of this review is to identify the hazards associated with the system in a systematic manner and develop a

[3] Anhydrous ammonia is one such listed substance.

[4] In analyzing the standard of care under the General Duty Clause, EPA consults industry standards, codes, and practices, many of which are referenced in the attached inspection reports and in the attached chart. An EPA guidance document that further explains the General Duty Clause may be found at https://www.epa.gov/sites/production/files/documents/gendutyclause-rpt.pdf.

plan for addressing them. This Hazard Review should follow industry standards and guidance, the citations to which are provided in the attached chart, and consider the dangerous conditions identified in the attached chart,[5] the list of critical action items prepared by EPA's refrigeration expert (Attachment 2), and any other hazards that you or your contractors find.

g. Submit a work plan and schedule for correcting all the hazards identified in the Hazard Review and Order.

In order to prioritize safety and the most critical work, EPA's Order will not address penalties or violations of other environmental laws (such as EPCRA and CERCLA), although EPA will likely address those matters in the future. The Order will also not address additional compliance work that may be required by OSHA, BFD, DPS, the Department of Homeland Security, or other authorities, nor will it address potential penalties those authorities may seek. EPA has been and continues to coordinate extensively with those authorities, in an effort to ensure that EPA's Order does not conflict with any work that other federal, state, or local officials may require.

We ask that Stavis keep an open line of communication with EPA while we are preparing the Order. For example, if Stavis plans to accelerate the schedule for moving to its new location at the Massport Marine Terminal rather than fix the existing system, please inform us as soon as possible so that we can discuss how to handle appropriate deadlines in the Order and avoid expenditures of any more money than necessary on the existing system. Also, we ask that you notify EPA within three business days of receiving this letter as to whether Stavis expects to cooperate with an EPA Order and has the resources to do so.[6] Given the number and complexity of the issues, EPA is willing to schedule a meeting with Stavis and its contractors to review the inspection reports and discuss the dangerous conditions EPA observed and the critical items that EPA's refrigeration expert identified as needing to be addressed immediately. Please let us know if you are interested in scheduling such a meeting by contacting Len Wallace at (617) 918-1835, or having your attorney call Laura J. Berry, Esq. at (617) 918-1148. Their email addresses are, respectively, Wallace.Len@epa.gov and Berry.LauraJ@epa.gov. If Len is not available, you may try his cell phone at (857) 829-8159 or call MaryJane O'Donnell at (617) 918-1371. Another EPA attorney, Maximilian Boal, also is working on this matter, so please copy him on any emails. His email address is Boal.Maximilian@epa.gov.

While we are preparing the Order, we advise you to call OSHA to obtain advice on how to best protect your employees and contractors with protective clothing and gear so that they are not at risk. We also advise that you coordinate with BFD to ensure that employees of neighboring businesses and the general public are not put at risk, particularly until such time as all ammonia and oil is fully purged from the system.

This letter also encloses a request for information that EPA has prepared in order to obtain some more information about the refrigeration system and further determine the compliance status of the Facility (the "Information Request," enclosed as Attachment 3).

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[5] This chart may be modified before issuance of the final Order in the event that additional dangerous conditions are identified.

[6] We understand that it is difficult to make this judgment without seeing an Order first. Your contractor may be able to review the attached chart and give you a rough idea of how much it may cost to fix or replace the system. We also are willing to share copies of similar orders with you upon request.

Section 114(a)(1) of the CAA, 42 U.S.C. § 7414(a)(1), gives EPA the authority to require a company to submit such information as EPA may reasonably require to determine its compliance with the CAA. Likewise, Section 3007 of RCRA, 42 U.S.C. § 6927, authorizes EPA to obtain information from companies that that generate, store, treat, transport, dispose of, or otherwise handle hazardous wastes about such wastes. Section 104(e) of CERCLA, 42. U.S.C. § 9604(e), gives EPA the authority to require a company to submit information and documents regarding the identification, nature, and quantity of materials treated, stored, or disposed at a facility and regarding the nature or extent of a release or threatened release of a hazardous substance or pollutant or contaminant at or from a facility.

Compliance with this Information Request is mandatory. Failure to respond fully and truthfully, or to adequately justify any failure to timely respond can result in an enforcement action by EPA pursuant to Section 113 of the CAA, 42 U.S.C. § 7413, Section 3008 of RCRA, 42 U.S.C. § 6928, and Section 104(e) of CERCLA, 42 U.S.C. § 9604(e). These statutes permit EPA to seek the imposition of penalties. The Information Request is not subject to Office of Management and Budget review under the Paperwork Reduction Act. Please be further advised that provision of false, fictitious, or fraudulent statements or representations may subject you to criminal penalties under 18 U.S.C. § 1001.

You are required to submit responses to the Information Request (Attachment 3) **within thirty (30) calendar days** of receiving this letter to:

Leonard B. Wallace IV, EPA Enforcement Officer
U.S. EPA, Region 1
5 Post Office Square, Suite 100
Mail Code OES05-4
Boston, MA 02109-3912

As part of your response, please complete the declaration enclosed with the Information Request as part of Attachment 3 and provide a cover letter carefully specifying what documentation is included to answer each question. We recognize that it may be difficult to respond to some of the questions within 30 days, so I have authorized my staff to provide any necessary extensions.

As explained above, EPA has been and continues to coordinate with OSHA, DHS, and state/local agencies, so we do not expect EPA's Order or Information Request to conflict with any work required by those entities. However, should that not be the case, or should EPA's Order conflict with any work that any other federal, state, or local officials may require regarding the refrigeration system, please let EPA know so that all the parties can plan and prioritize accordingly. If you believe it would be helpful to schedule a joint meeting with EPA and OSHA and/or any other state or local authorities in order to further coordinate next steps regarding the ammonia refrigeration system, we are happy to discuss this option with you.

Finally, please ensure that any work Stavis or its contractors conduct on the system complies with codes, standards, and guidelines recognized as generally accepted good engineering practices so that such work does not inadvertently create more hazards.

If you have any questions regarding this letter or the enclosed documents, please contact Len Wallace or MaryJane O'Donnell, or have your attorney contact Laura J. Berry, Esq. using the contact information provided above.

Sincerely,

Susan Studlien

Susan Studlien, Director
Office of Environmental Stewardship
U.S. EPA Region 1

Enclosures:

Attachment 1:	Notice of Potential Violations of Clean Air Act Section 112(r)
Attachment 2:	Inspection and Expert Reports with two CDs of photos
Attachment 3:	Information Request
Attachment 4:	Ammonia Refrigeration Enforcement Alert
Attachment 5:	U.S. EPA Small Business Resources Sheet

cc: Nicholas Nesgos, Posternak Blankstein & Lund
James Kruzer, Posternak Blankstein & Lund
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Craig Haas, OECA, EPA Headquarters
Steven McGillis, Boston Fire Department
Brian Logan, Massachusetts Department of Public Safety
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Mark A. Pedulla, DOL
Charles Colley, DHS
Brian Donohue, DOJ
MaryJane O'Donnell, EPA
Laura J. Berry, EPA
Catherine Smith, EPA
Maximilian Boal, EPA
Len Wallace, EPA

Attachment 1

Notice of Potential Violations

EPA inspectors and their contractors found several dangerous conditions at the Facility, listed in the table below, that may give rise to violations of the General Duty Clause. Many of these conditions indicate that the Facility is not following industry standards of care that are common in the ammonia refrigeration industry.

In addition to older standards of care, the chart includes references to the 2014 version of International Institute of Ammonia Refrigeration's Standard 2 to ensure that any new work on the refrigeration system is consistent with the latest industry standards. EPA's inspection report for the April 6, 2016 inspection includes some additional historical standards of care that are not included in this chart.

Dangerous Condition	**Potential GDC Violation**	**How Condition Could Lead to an Accidental Release or Exacerbate Consequences of a Release**	**Examples of Industry Standards of Care**
Lack of a hazard analysis that identifies hazards posed by the System. Stavis Seafoods had a hazard review/analysis form in its computer files, but only one page was filled out.	Failure to identify hazards which may result from accidental releases of extremely hazardous substances, using appropriate hazard assessment techniques	Increases likelihood that a dangerous situation will not be recognized in time to prevent a release. Increases likeilhood that any response to such a release will be less efficient and effective because the scenario was unanticipated and the response unplanned. Increased risk to emergency responders and increased potential for off-site impact.	The recommended industry practice and standard of care for ammonia refrigeration systems of this size would be to identify hazards using industry checklists, a What-if analysis, or a Hazard and Operability study. See e.g., the International Institute of Ammonia Refrigeration's ("IIAR's") *Ammonia Refrigeration Management Program* (2005), Section 10; EPA's *Guidance for Implementation of the General Duty Clause Clean Air Act Section 112(r)(1),* available at http://www.epa.gov/oem/docs/chem/gdcregionalguidance.pdf; and IIAR Bulletin No. 110, *Start-up, Inspection and Maintenance of Ammonia Mechanical Refrigerating Systems* (1993, rev. 2002) Section 5.2.1 [The owner shall confirm that a Process Hazard Analysis has been completed and that recommendations have been resolved or implemented.]

Dangerous Condition	Potential GDC Violation	How Condition Could Lead to an Accidental Release or Exacerbate Consequences of a Release	Examples of Industry Standards of Care
Inadequate documentation available about the technology and equipment in the process. For example, the Piping and Instrumentation Diagram posted in the Ammonia Machinery Room did not include some of the key equipment present in that room. Nor did the facility have pressure relief vent calculations to verify that the vent header was appropriately sized. Also there were missing "U' or "UM" stamps, nameplates, or National Board numbers on various pressure vessels (or other information about those vessels)	Failure to identify hazards which may result from accidental releases, using appropriate hazard assessment techniques. Failure to design and maintain a safe facility taking such steps as are necessary to prevent releases.	These documents provide operators and inspectors with essential understanding of the functioning and capacity of the system and the risks that the system poses. They are also essential in ensuring the proper maintenance of the system. Releases are more likely, and their consequences more severe, when there is limited information available for hazard identification and minimization.	IIAR Bulletin No. 109 (1997), *Minimum Safety Criteria for a Safe Ammonia Refrigeration System*, [Safety Inspection Checklists]; Section 4.3.1.2 (specifying name plate requirements for pressure vessels) IIAR Bulletin No. 110, *Start-up, Inspection and Maintenance of Ammonia Mechanical Refrigerating Systems*, Section 4 [Records]; Section 6.4 [testing/information requirements to demonstrate that pressure vessels are fit for service] IIAR's *Ammonia Refrigeration Manual*, Section 3, including MSDS sheets, documentation of ammonia inventory at facility (e.g., documentation of ammonia charges, ammonia inventory during pump-out conditions, or detailed pipe-by-pipe/vessel-by-vessel inventory calculations); refrigeration flow diagrams; facility plan view (for use with fire department); equipment list for ammonia refrigeration equipment with detailed information about the equipment; desired system operating ranges (document desired system operating ranges for pressure, levels, and temperatures in the system); information re. safety systems (e.g., alarms, compressor cut-outs, and ammonia detection systems); relief system design; ventilation system capacity; installation, operation, and maintenance manuals; and manufacturers data reports for all pressure vessels) ANSI/IIAR 2-2014, Sections 15.3.7 (specifying that pressure relief devices shall have sufficient mass flow carrying capacity to limit the pressure rise in protected equipment to prevent catastrophic failure and setting out how to determine capacity of pressure relief devices for several different types of vessels including pressure vessels, oil separators, plate heat exchangers, shell and tube heat exchangers, product storage tanks); 15.5 (specifying how and where ammonia should be discharged through pressure relief devices – generally to the atmosphere with some exceptions, and how to calculate length of discharge pipe); 12.2.2 (specifying that pressure vessels exceeding 6 inches inside diameter must comply with the ASME Boiler and Pressure Vessel Code, Section VIII Division 1); 12.4.1 (specifying information that must be on pressure vessel nameplates, including manufacturer's name, max. allowable working pressure information, minimum design metal temperature information, manufacturer's serial number, year of

Dangerous Condition	Potential GDC Violation	How Condition Could Lead to an Accidental Release or Exacerbate Consequences of a Release	Examples of Industry Standards of Care
to show that they were fit for service.			manufacture, manufacturer's model number where applicable, and a stamp affixed to the equipment with the minimum design metal temperature that the equipment is operated at in accordance with the ASME Boiler and Pressure Vessel Code, Section VIII, Div. 1); 5.14.4 (Requiring that equipment shall have a nameplate with minimum data that describes or defines the manufacturer's information and design limits and purpose as specified in Chapter 8 through Chapter 16, specifications regarding how the nameplates shall be affixed, and requirements for duplicate nameplates). ANSI/IIAR 2-2008, Sections 9.3 (nameplate requirements for pressure vessels); 11.2.7 (specifying the required discharge capacity of a pressure relief device); and 11.3 ("The size of the discharge pipe from a pressure-relief device shall not be less than the outlet size of the pressure-relief device. The size and maximum equivalent length of common discharge piping downstream from each of two or more relief devices shall be governed by the sum of the discharge capacities of all the relief devices that are expected to discharge simultaneously, at the lowest pressure setting of any relief devices that discharging into the piping, with due allowance for the pressure drop in all downstream sections.") ANSI/ASHRAE 15-2013, Sections 9.7.5 (specifying minimum discharge capacities of pressure-relief device or fusible plugs for each pressure vessel), 9.7.6 (specifying how to determine the rated discharge capacity of a pressure relief device and specifying that all pipe and fittings between the pressure-relief valve and the parts of the system it protects shall have at least the area of the pressure-relief valve inlet area); 9.7.7 (formulas for determining rated discharge capacity); 9.3.2 (Pressure vessels having an inside diameter exceeding 6 inches and having an internal or external design pressure greater than 16 psig shall be directly marked, or marked on a nameplate, with a "U" or "UM" symbol signifying compliance with the rules of Section VIII of the AME Boiler and Pressure Code.); 9.4 (pressure relief protection) National Board Inspection Code Part 2 – Inspection (regarding procedures to follow when nameplates are missing)

Dangerous Condition	Potential GDC Violation	How Condition Could Lead to an Accidental Release or Exacerbate Consequences of a Release	Examples of Industry Standards of Care
Five of the oil separator pressure vessels are not protected by pressure-relief devices to safely relieve pressure buildup that could occur during fires or abnormal conditions	Failure to design and maintain a safe facility taking such steps as are necessary to prevent releases.	Failure to have pressure relief devices on pressure vessels can lead to catastrophic failure during fire or abnormal conditions, releasing ammonia.	ANSI/IIAR 2-2008, Section 11.2.1 ("Pressure vessels shall be provided with pressure relief protection in accordance with rules given in the governing edition of Section VIII, Division 1, ASME Boiler and Pressure Vessel Code."); 11.2.2 ("Pressure vessels containing liquid refrigerant that are capable of being isolated by stop valves from other parts of a closed-circuit ammonia refrigerating system shall be provided with overpressure protection." ANSI/IIAR 2-2014, Sections 15.3.1 (requiring pressure vessels and other types of equipment built and stamped in accordance with ASME Boiler and Pressure Vessel Code, Section VIII, Division 1 to be provided with certified pressure relief protection.) ANSI/ASHRAE 15-2013, Section 9.4 (requiring pressure vessels to be protected with overpressure protection) IIAR Bulletin 109, Section 4.9.1 ("Single or dual safety pressure relief valves or other suitable relief devices shall be provided on all vessels, heat exchangers, oil pots, oil stills and elsewhere on the ammonia refrigerating system….") IIAR Bulletin 110 (1993), Section 6.8 ["In all instances, the removal of oil must be done very carefully. You must remember liquid ammonia can be present behind the oil, or that there may not be oil present, only liquid ammonia. The oil drain valve should be a rapid closing valve."……"A pressure relief valve should be installed on all oil pots."]
Excessive corrosion on refrigeration piping in the Ammonia Machinery Room. Also, on the roof, the inspectors observed several instances of rusted valves and piping around	Failure to design and maintain a safe facility taking such steps as are necessary to prevent releases.	Risks release of ammonia from pipes and/or system components if corrosion continues to point of failure.	The industry standard of care calls for a *preventative* maintenance program. See e.g., IIAR's *Ammonia Refrigeration Manual,* Section 5 and Appendix 5.1; IIAR Bulletin No. 110, *Startup, Inspection and Maintenance of Ammonia Mechanical Refrigerating Systems,* Section 4.3 [regarding inspection of equipment after being out of use for, among other things, corrosion]; Section 6.6 [Inspection and Maintenance – Valves and Sensing Devices] and Section 6.7 [Inspection and Maintenance – Piping]. IIAR Bulletin No. 109, *IIAR Minimum Safety Criteria for a Safe Ammonia Refrigeration System,* Sections 4.7.4 and 4.7.5 and inspection checklists [4.7.4 --Uninsulated refrigerant piping should be examined for signs of corrosion. If corrosion exists, the pipe should be cleaned down to bare metal and painted with a rust prevention paint. Badly corroded

Dangerous Condition	Potential GDC Violation	How Condition Could Lead to an Accidental Release or Exacerbate Consequences of a Release	Examples of Industry Standards of Care
uninsulated valve manifolds.			pipe should be replaced.] [4.7.5 –Insulated piping showing signs of vapor barrier failure should have the insulation removed and the pipe inspected….]; [Inspection checklists have corrosion monitoring question for pressure vessels, heat exchangers, evaporators, condensers, and piping.] FM Global Property Loss Prevention Data Sheet 12-61 *Mechanical Refrigeration*, Section 2.2.1.2 [Piping, heat exchangers and other system pressure vessels should be well supported and protected against mechanical and corrosion damage.] Section 53.3.1.1 of NFPA 1 (2012 ed.)[1] [Refrigeration systems shall be operated and maintained in a safe and operable condition, free from accumulations of oil, dirt, waste, excessive corrosion, other debris or leaks, and in accordance with ASHRAE 15 and the mechanical code.] IMC 2009, Section 1101.7 [Mechanical refrigeration systems shall be maintained in proper operating condition, free from accumulations of oil, dirt, waste, excessive corrosion, other debris and leaks.] ANSI/IIAR 2-2014, Section 13.4.2 [requiring refrigerant piping to be isolated and supported to prevent damage from vibration, stress, corrosion, and physical impact]
Damaged, stained, and missing insulation in multiple areas on ammonia piping and vessels in the Ammonia Machinery Room, roof and in other	Failure to design and maintain a safe facility taking such steps as are necessary to prevent releases.	Vapor barriers protect pipes and vessels from moisture, which causes corrosion. Corroded pipes and vessels can break or succumb to pressure, causing an ammonia release.	IIAR Bulletin No. 109, *IIAR Minimum Safety Criteria for a Safe Ammonia Refrigeration System,* Section 4.7.5 [Insulated piping showing signs of vapor barrier failure should have the insulation removed and the pipe inspected….] IIAR Bulletin 110 -- 6.7.2 [Insulated Piping: Any mechanical damage to insulation should be repaired immediately and the vapor seal reinstated to prevent access of water or water vapor which will lead to breakdown of insulation and corrosion of the pipework.]; 6.4.3 [Annual Inspection: "In the case of pressure vessels and heat exchangers covered by insulation, any effects of dampness or deterioration of the insulation which could lead to the eventual corrosion of the vessel or its connections shall be investigated. Surface

[1] See 53.5.1 and 53.5.3 of NFPA 1 (2003 and 2006 edition). Citations in the 2012 edition changed considerably from earlier versions.

Dangerous Condition	Potential GDC Violation	How Condition Could Lead to an Accidental Release or Exacerbate Consequences of a Release	Examples of Industry Standards of Care
areas containing ammonia piping. In addition, on the loading dock, the inspectors observed a section of ammonia piping wrapped in a type of insulation that retains moisture and liquid between the insulation and piping, increasing the likelihood of corrosion.			treatment shall be applied to the vessels if required and the insulation shall be repaired within the shortest time."] ANSI/IIAR 2-2014, Section 5.10.1 [piping and equipment surfaces not intended for heat exchange shall be insulated, treated, or otherwise protected to mitigate condensation and excessive frost buildup]; See also Section 6.6.1 [piping and fittings shall be insulated as required by Section 5.10]
Faulty Ventilation: The Ammonia Machinery Room's mechanical air intake louvers had a non-functional motor. During the first inspection, the emergency ventilation was turned on, but the louvers did not open. They also were in the closed position when power was off.	Failure to design and maintain a safe facility taking such steps as are necessary to prevent releases. Failure to minimize the consequences of releases which do occur.	Without adequate ventilation, vapors are more likely to build up to levels that are significant inhalation and dermal hazards or that risk causing fire or explosion. Also, where an exterior emergency ventilation on-switch is lacking or not functioning, the buildup of dangerous levels of toxic/flammable vapors in a machinery room can delay the entry of emergency response personnel to shut off the system, resulting in a prolonged release.	ANSI/ASHRAE 15-2013, *Safety Standard for Refrigeration System,* Section 8.11.4 ["Mechanical ventilation referred to in Section 8.11.3 shall be by one or more power-driven fans capable of exhausting air from the machinery room at least in the amount given in the formula in Section 8.11.5. Provision shall be made for inlet air to replace that being exhausted. Openings for inlet air shall be positioned to avoid recirculation…"] ANSI/IIAR 2-2008 (2012 ed.), *Equipment, Design, and Installation of Closed-Circuit Ammonia Mechanical Refrigerating Systems,* Section 13.3.8.1 [Normal mechanical ventilation design capacity shall be the greater of (a) 20 Air Changes per hour (20 ACH) based on the total gross volume of the machinery room, (b) The volume required to limit the room temperature to 104°F (40°C) taking into account the ambient heating effect of all machinery in the room and with the ventilation air entering the room at a 1% ASHRAE design….]; Section 13.3.9.1 [Emergency mechanical ventilation systems shall be capable of providing at least one air change every two minutes, which is 30 air changes per hour (30 ACH) based on the gross machinery room volume.] Section 13.3.9.2 [Emergency

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			mechanical ventilation shall be actuated by (a) A refrigerant detector at a level not exceeding 1,000 ppm; (b) Manual controls.] ANSI/IIAR 2-2014, Section 6.14.5 (Inlet Air), specifically 6.14.5.1 [Outside air shall be provided to replace air being exhausted and shall maintain negative pressure in the machinery room]; Section 6.14.5.5 [Intakes for makeup air to the machinery room shall serve only the machinery room.]; Section 6.14.5.6 [Motorized louvers or dampers, where utilized, shall fail to the open position upon loss of power.]; Section 6.14.7.2 [Emergency mechanical ventilation shall be activated by both an ammonia leak detection and a manual control switch.]; App. K [alternative ventilation calculation methods]; Also see Section 53.2.3.3 of NFPA 1 (2012 ed.) [re. ventilation systems][2] IMC 2009, Sections 1105.6 [Machinery rooms shall be mechanically ventilated to the outdoors. Mechanical ventilation shall be capable of exhausting the minimum quantity of air (as further required by this section) both at normal operating and emergency conditions], 1105.4 [Periodic tests of the mechanical ventilating system shall be performed in accordance with manufacturer's specifications and as required by the code official.], and 1106.5.2 [A clearly identified switch of the break-glass type shall provide on-only control of the machinery room ventilation fans.].
Lack of functioning audio/visual alarms: There were no visual and audible alarms in the Ammonia Machinery Room. Nor were there audio/visual alarms outside other rooms	Failure to design and maintain a safe facility taking such steps as are necessary to prevent releases.	Ammonia detectors and alarms provide early warning that a release is taking place, enabling quick response and protecting workers, emergency responders, and the public from a larger release.	ANSI/IIAR 2-2008 (Add. B, 2012 ed.), *Equipment, Design, and Installation of Closed-Circuit Ammonia Mechanical Refrigerating Systems*, Section 13.2 [Each refrigerating machinery room shall contain at least two refrigerant detectors that actuate an alarm and mechanical ventilation.]; Section 13.2.1.2 [The detectors shall activate visual and audible alarms inside the refrigerating machinery room and outside each entrance to the refrigerating machinery room.] ANSI/IIAR 2-2014, Sections 6.13.1 and 17.7 [The machinery room shall have at least one ammonia detector that activates alarm that reports to monitored location at concentration of 25 ppm or higher; audible and visual alarms shall be provided inside

[2] Sections 53.10.4 and 53.10.5 of NFPA 1 (2006 edition).

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containing ammonia refrigeration equipment and piping. Outside the primary entrance to the Ammonia Machinery Room was an inadequately labeled visual alarm, but no audio alarm was present. There were no audio or visual alarms near the second-floor doors of the Ammonia Machinery Room should someone attempt to enter the room from the outside (e.g., by ladder or fire truck). Moreover, the M&M system printout indicated that, although the vapor detector in the Ammonia Machinery Room was functioning to detect	Failure to minimize the consequences of releases which do occur.		machinery room to warn that access restricted to authorized personnel and emergency responders when alarm activated; additional audible and visual alarms shall be located outside each entrance to machinery room]; 6.13.2.3 [Detection of ammonia equal to or exceeding 150 ppm shall activate visual indicators and audible alarm and activate emergency ventilation; emergency ventilation shall continue to operate until manually reset by a switch located in the machinery room]; 6.13.2.4 [Detection of ammonia concentration that exceeds detector's upper detection limit or 40,000 ppm (25% LFL), whichever is lower, shall activate visual indicators and audible alarm and emergency ventilation; ventilation will continue to operate until manually reset; refrigerant compressors, refrigerant pumps, and normally closed automatic refrigerant valves not part of emergency control system will be automatically de-energized]; 7.2.(Requirements for Nonmachinery Room Spaces, specifically 7.2.3 which provides – with key exceptions – that Level 1 detection and alarm shall be provided in accordance with 17.7.1 and that the detection/alarm system shall comply with Chapter 17; 17.4 [detectors shall be mounted in position where ammonia from a leak is expected to accumulate]; 17.7.3 [additional requirement that level 3 alarm shall activate system to close control valves and de-energize refrigerant pumps, nonemergency fans and other motors]; 17.5 [audible alarms shall provide sound pressure level of 15 decibels (dBA) above average ambient sound level and 5 dBA above maximum sound level of the area] ANSI/ASHRAE 15-2013, *Safety Standard for Refrigeration System,* Section 8.11.2.1 [Each refrigerating machinery room shall contain a detector located in an area where refrigerant from a leak will concentrate that activates an alarm and mechanical ventilation….The alarm shall annunciate visual and audible alarms inside the refrigerating machinery room and outside each entrance to the refrigerating machinery room.] NFPA 1 (2012 ed.) Section 53.2.3.1 [requirement for vapor detectors, monitors and alarm system]; Section 8.12.h [When ammonia is used, the machinery room is not required to meet Class 1, Division 2 of the National Electric Code provided (a) the mechanical ventilation system in the machinery room is run continuously and failure of the mechanical ventilation system actuates an alarm or (b) the machinery room is equipped

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levels of ammonia during the March 23 incident, the safety interlocks between this detector and the alarm/system shutdown had been disabled for months. (The interlock between this detector, the ventilation system, and the compressors also was disabled.)			with a detector, conforming to Section 8.11.2.1, except the detector shall alarm at 1000 ppm.] IIAR's Ammonia Refrigeration Manual (2005), Appendix A, item 9.2 at A10-36
Hansen ammonia detectors in the machinery room, cooler rooms, freezer room, and loading dock near the ceiling had not been calibrated since January 2015, and no record of bump tests was provided.	Failure to design and maintain a safe facility taking such steps as are necessary to prevent releases. Failure to minimize the consequences of releases which do occur.	Properly functioning ammonia detectors provide early warning that a release is taking place, enabling quick response and protecting workers, emergency responders, and the public from a larger release.	Hansen Bulletin A100 (Feb. 2008), indicating that bump tests should be completed at least once every six months and calibration of the sensors should be completed annually at a minimum. ANSI/IIAR 2-2014, Section 17.3 (Testing requirements for ammonia detection and alarms, specifying that a schedule for testing shall be established based on manufacturer's recommendations unless modified based on documented experience. Where manufacturer's recommendations are not provided, they shall be tested at least annually.) IIAR Bulletin 110, Section 6.6.4 (Specifies that manufacturer's instructions should be followed for inspecting, testing, calibrating and overhauling the following equipment: sensing devices, monitoring devices, sensors, alarms, interlocks, and emergency shutdown systems). ANSI/ASHRAE 15-2013, *Safety Standard for Refrigeration System,* Section 11.6.3 ["Detector(s), alarm(s) and mechanical ventilating systems shall be tested in accordance

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			manufacturers' specifications and the requirements of the jurisdiction having authority."] NFPA 1 (2012 ed.) Sections 53.2.3.1.7, 53.3.2.2, 53.3.2.3 and 53.3.2.4
Problems with remote controls for activating ventilation and shutting down refrigeration equipment: There was a remote emergency shutdown control and ventilation switch outside the machinery room door, but these controls lacked clear signage about their function and were not easily accessible to emergency responders, due to a missing key. Moreover, the existing remote controls would have been difficult for a person working in the machinery room	Failure to design and maintain a safe facility taking such steps as are necessary to prevent releases. Failure to minimize the consequences of releases which do occur.	Creates risk of harm to workers and emergency responders who cannot quickly shut down or properly ventilate machinery room without entering the room, which could contain dangerous levels of vapors. The delay could also contribute to a longer ammonia release time, increasing risks to workers, emergency responders, and people off-site.	ANSI/ASHRAE 15-2013, *Safety Standard for Refrigeration Systems,* Section 8.12.i [Remote control of the mechanical equipment in the refrigerating machinery room shall be provided immediately outside the machinery room door solely for the purpose of shutting down the equipment in an emergency. Ventilation fans shall be on a separate electrical circuit and have a control switch located immediately outside the machinery room door.] ANSI/IIAR 2-2008 (Add. B, 2012 ed.), *Equipment, Design, and Installation of Closed-Circuit Ammonia Mechanical Refrigerating Systems,* Section 13.1.13.2 [A remote emergency shutdown control for refrigerant compressors, refrigerant pumps, and normally closed automatic refrigerant valves within the machinery room, shall be provided immediately outside the designated principle exterior machinery room door...]; Section 13.3.1 [….The mechanical ventilation systems shall be powered independently of the machine room machinery and shall not be subject to emergency shutdown controls.].; Section 13.3.11 [Ventilation Remote Controls, specifically 13.3.11.1 which specifies that emergency remote controls for the emergency mechanical ventilation systems shall be provided and be located immediately outside the designated principle exterior machinery room door; 13.3.11.2 which specifies that the function of the emergency remote controls shall be clearly marked by signage near the controls; 13.3.11.3 which specifies that there must be an "on/auto" override for emergency ventilation immediately outside the designated principle exterior machinery room door; and 13.3.11.4 which states that there should be a "on/off/auto" override for normal and emergency ventilation at a secured remote location."] ANSI/IIAR 2-2014, Section 15.15 [Directions for emergency shutdown should be provided at a location readily accessible to trained refrigeration system staff and trained emergency responders; schematic drawings or signage should include details/steps for shutting down the system in an emergency; contact names and telephone numbers for

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to access in an emergency, given that the machinery room was upstairs from the remote controls, with no separate door or remote controls upstairs. Also, the emergency ventilation system was not working on the day of EPA's March 24 inspection; the emergency ventilation was turned on but the air intake louvers were not functioning. Finally, the emergency shut-off switch did not turn off all the electrical power to the machinery room, risking ignition of ammonia vapors during a release; an			refrigeration system operating, maintenance and management staff, emergency responders, and safety personnel; contact names and telephone numbers of corporate, local, state and federal agencies to be contacted in event of reportable incident; quantity of ammonia in the system, type and quantity of refrigerant in system; and the field test pressures applied]; Section 6.12.1 [Emergency Stop Switch. A clearly identified emergency shut-off switch with a tamper resistant cover shall be located outside and adjacent to the designated principal machinery room door. The switch shall provide off-only control of refrigerant compressors, refrigerant pumps, and normally closed automatic refrigerant valves located in the machinery room. The function of the switch shall be clearly marked by signage near the controls.]; 6.12.2 [Emergency Ventilation Control Switch. A clearly identified control switch for emergency ventilation with a tamper-resistant cover shall be located outside the machinery room and adjacent to primary machinery room door. The switch shall provide "ON/AUTO" override capability for emergency ventilation. The function of the switch shall be clearly marked by signage near the controls.]; Section 6.14.7.3 [Emergency ventilation shall be powered independently of machine room equipment and continue to operate regardless of whether emergency shutdown controls have been activated.] NFPA 1 (2012 ed.) Section 53.2.3.1.4 [emergency shut-off interface requirements, requiring vapor detectors to automatically turn off electrical power at concentrations at or above 25% of LFL]; 53.2.3.3.1 [requiring emergency ventilation switch right outside machinery room door].[3] Also, see Sections 53.2.3.4.5 (shutoffs for refrigeration machinery) and 53.2.3.3.1 (ventilation switch).

[3] Sections 53.11, 53.10.2, 53.10.9, and 5.10.5 of NFPA-1 2006 edition.

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air compressor came on during the March 24 inspection although the emergency shut-off was activated.			
The Ammonia Machinery Room pressure relief vent line is located less than 7.5 feet above the Cooler Room B roof level. The high pressure relief pipe and emergency exhaust fan were less than 20 feet from the property line.	Failure to minimize releases that do occur	Improperly placed discharge reliefs and exhaust fans can result in ammonia being sprayed on people during a release, further exacerbating the consequences of a release.	ANSI/IIAR 2-2008 (Add. B., 2012 ed.), Sections 11.3.6.3 [requirement for pressure relief to discharge at least 20 feet from window, ventilation intake or personnel exit] and 11.3.6.4 [requirement to discharge to atmosphere at least 15 feet above adjacent roof level] ANSI/IIAR 2-2014, Section 15.5 [pressure relief device discharge piping must discharge at least: 7.25 feet above the roof, adjacent roof line or platform surface; 15 feet above grade and at least 20 feet from windows, ventilation intakes, or exits, and discharge shall be directed upward and arranged to avoid spraying ammonia on persons in the vicinity]; 6.14.3.4 [Machinery room exhaust shall vent to the outdoors no fewer than 20 feet from a property line or openings into the buildings.] ANSI/ASHRAE 15 (2013) Section 9.7.8 [Requires discharge to atmosphere 15 feet above adjoining ground level and not less than 20 feet from window, ventilation opening, or exit. Discharge shall terminate in a manner that will prevent discharged refrigerant from being sprayed on people.]; NFPA 1 (2012 ed.) Section 53.2.2.1.2 (15 feet discharge to atmosphere requirement plus some other discharge options for ammonia flaring and diffusion systems].[4] See also, Section 53.2.3.3.12 (exhaust must discharge at least 20 feet from the property line or openings into the building) IMC 2009, Sections 1105.7 [Pressure relief devices, fusible plugs and purge systems located within the machinery room shall terminate outside of the structure at a location

[4] Section 53.8.3.2 of NFPA 1-2006 edition.

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			not less than 15 feet above the adjoining grade level and not less than 20 feet from any window, ventilation opening or exit]; 1105.6.1 [Exhaust from mechanical ventilation systems shall be discharged not less than 20 feet from a property line or openings into buildings.]
Failure to have an oil drain system on each of the high pressure receiver vessels with an appropriate quick-closing valve.	Failure to design and maintain a safe facility so as to prevent releases Failure to minimize the consequences of releases which do occur.	Draining oil from ammonia-containing machinery can be dangerous because liquid ammonia can be present behind the oil. The self-closing or quick-closing valve is intended to immediately close the system in the event of a problem, minimizing a release of ammonia and reducing the likelihood of a catastrophic injury from exposure from ammonia to a mechanic draining oil from the system.	ANSI/IIAR 2-2008 (Add. B., 2012 ed.), Section 14.2.3 [Oil removal shall be accomplished by one or more of the following: a) A rigid piped oil return system; b) A vessel equipped with an oil drain valve in series with either a self-closing or manual quick-closing emergency stop valve connected to the oil drain point, a vent line isolation valve, and an approved pressure relief device; c) Piping which provides capability for isolation and refrigerant removal to another portion of the system; d) An oil drain valve in series with a self-closing or manual quick closing emergency stop valve; e) any other suitably engineered system.] ANSI/IIAR 2-2014, Section 5.9.3 [Oil removal shall be accomplished by one or more of the following: a) A rigid piped oil return or transfer system; b) vessel equipped with a shut-off valve in series with a self-closing shut-off valve; c) valve and piping assembly at the draining point where oil is removed from system -- at a minimum, a shut-off valve in series with self-closing shut-off valve.] IIAR Bulletin 110 (1993), Section 6.8 ["In all instances, the removal of oil must be done very carefully. You must remember liquid ammonia can be present behind the oil, or that there may not be oil present, only liquid ammonia. The oil drain valve should be a rapid closing valve."……"A pressure relief valve should be installed on all oil pots."] IIAR's *Ammonia Refrigeration Manual* (2005), Appendix A, items 5.14 ["If oil must be removed from the pressure vessels, are the pressure vessels equipped with one of the following alternatives: (a) a rigid piped oil return system, (b) an oil pot, (c) piping which provides capability for isolation and ammonia removal to another portion of the system, (d) an oil drain valve in series with a self-closing or manual quick-closing emergency stop valve with rigid piping 2-4 feet away from and within sight of the valves, or (e) another approved system?"; 5.15 ["If the pressure vessels are equipped with oil pots, do the oil

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			pots have an oil drain valve, an isolation valve connected to the oil drain point, a vent line, a vent line isolation valve, and an approved pressure-relief device?]
Fire Hazards: Open electrical junction boxes, loose wiring, and light sockets without bulbs were present in the Maintenance Room and in the Ammonia Machinery Room. The electrical switchgear room inside of the expansion Ammonia Machinery Room contained electrical conduit that was dripping water from a fitting, indicating that water was present inside the conduit and presenting an electrical hazard. There were also combustible	Failure to design and maintain a safe facility taking such steps as are necessary to prevent releases. Failure to minimize the consequences of releases which do occur.	Exacerbates risk of fire or explosion. Ammonia is flammable at certain concentrations.	ANSI/IIAR 2-2008 (Add. B., 2012 ed.), *Equipment, Design, and Installation of Closed-Circuit Ammonia Mechanical Refrigerating Systems*, Section 13.1.3.1 [Flammable and combustible materials shall not be stored in machinery rooms.]; Section 13.1.7 Electrical Safety [requires wiring to be installed in accordance with the National Electrical Code]; NFPA 1 (2012 ed.), Section 53.3.1.3.1 [Flammable and combustible materials shall not be stored in the refrigeration machinery rooms except for incidental materials necessary for the safe and proper operation and maintenance of the system.][5]; 53.2.3.4 and 11.1 [electrical equipment and electrical installations in refrigeration machinery room shall comply with Section 11.1] IIAR Bulletin 109 *Minimum Safety Criteria for a Safe Refrigeration System*, General Safety checklist, item (x) [Covers should be fastened to all electrical panels and junction boxes.] 29 C.F.R. § 1910.303(g)(2) (guarding of live parts) NFPA 70 (National Electric Code) (2011), Section 110-27 (guarding of live parts)

[5] Section 53.10.7, 53.12, and 53.10.8.2 of NFPA-1 (2006 edition). Note that NFPA 1 (2006 ed.) has different provisions than the 2012 edition for electrical safety, but the restriction on storage of flammable or combustible materials is the same as in the 2012 edition.

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materials in areas that were not separated from the Ammonia Machinery Room (e.g., wooden stairs, flammable items stored on first floor). Heaters on loading dock, near evaporator units and ammonia piping, are an ignition source and fire hazard in the event of an ammonia release. Not interlocked with ammonia detection system.			
The machinery room door was not adequately labeled to: ○ warn of the hazards of entering a room with ammonia-containing machinery;	Failure to design and maintain a safe facility taking such steps as are necessary to prevent releases.	Increases the chance of inadvertent exposure to ammonia releases and could frustrate effort to react quickly and properly during an ammonia release. Signs and posted information provide a level of protection in addition to worker training and operating procedures.	ANSI/IIAR 2-2008 (Add. B., 2012 ed.), *Equipment, Design, and Installation of Closed-Circuit Ammonia Mechanical Refrigerating Systems,* Section 13.1.10.4: In section entitled, "Entrances and Exits" is a requirement that refrigerating systems shall be provided with approved informative signs, emergency signs, charts and labels in accordance with NFPA 704. Hazard signs shall be in accordance with International Mechanical Code. Refers to Appendix L. Also see Section 13.1.2.4 (signs restricting entry to authorized personnel), Section 13.2.4.1 (signs with meaning of alarms near the visual and audible alarms); and Appendix L (examples of recommended machinery room door signage);

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○ restrict access to authorized personnel; ○ provide appropriate information about alarms; ○ and provide information about emergency procedures.	Failure to minimize the consequences of releases which do occur.		ANSI/IIAR 2-2014, Sections 6.3.4 and 6.15 [requires that access to machinery room be restricted to authorized personnel and that machinery room doors shall have restricted access, signage, alarm signage and NFPA 704 placards]; Sections 6.15.2 and 17.6 [use of signage to identify ammonia leak detection alarms]; Appendix J [examples of recommended machinery room door signage] ANSI/ASHRAE 15-2013, *Safety Standard for Refrigeration Systems*, Sections 8.11.2.1 (signs with meaning of alarms); 8.11.8 (signs restricting entry to authorized personnel); 11.2.4 (same); 11.7 (posted emergency shutdown procedures); NFPA 704 (re. readability of signs) IIAR's Ammonia Refrigeration Manual (2005), Appendix A, item 11.3 at A10-40 ["Is access to the machinery room(s) restricted to authorized personnel?"]
There were no emergency shutdown instructions in any of the documents that were collected from the company or posted on signs.	Failure to design and maintain a safe facility taking such steps as are necessary to prevent releases. Failure to minimize the consequences of releases which do occur.	Increases the chance of exposure to ammonia releases and could frustrate effort to react quickly and properly during an ammonia release. Signs and posted information provide a level of protection in addition to worker training and operating procedures. Proper emergency procedures can also prevent larger releases.	IIAR Bulletin 109, Section 4.10.5 [A sign or signs should be posted in a conspicuous location providing emergency instructions and phone numbers of emergency safety and operating personnel.] ANSI/AHSRAE 15-2013, Section 11.7 [Responsibility for Operation and Emergency Shutdown: …..Emergency shutdown procedures, including precautions to be observed in case of a breakdown or leak, shall be displayed on a conspicuous card located as near as possible to the refrigerant compressor. These precautions shall address a. instructions for shutting down the system in case of an emergency; b. the name, address, and day and night telephone numbers for obtaining service; c. the names, addresses and telephone numbers of all corporate, local, state, and federal agencies to be contacted in the event of a reportable incident. When a refrigerating machinery room is used, the emergency procedures shall be posted outside the room, immediately adjacent to each door. The emergency procedures shall forbid entry into the refrigerating machinery room when the refrigerant alarm required by Section 8.11.2.1 has been activated except by persons provided with the appropriate respiratory and other protective equipment and trained in accordance with jurisdictional requirements.]

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			ANSI/IIAR 2-2014, Section 5.15 [Emergency Shutdown Documentation. It shall be the duty of the person in charge of the premises at which the refrigeration system is installed to provide directions for the emergency shutdown of the system at a location that is readily accessible to trained refrigeration system staff and trained emergency responders. Schematic drawings or signage shall include the following: 1. Instructions with details and steps for shutting down the system in an emergency. 2. The name and telephone numbers of the refrigeration operating, maintenance, and management staff, emergency responders, and safety personnel. 3. The names and telephone numbers of all corporate, local, state, and federal agencies to be contacted as required in the event of a reportable incident. 4. Quantity of ammonia in the system. 5. Type of ammonia in the system. 5. Type and quantity of refrigerant oil in the system. 6. Field Pressures applied.] IIAR's *Ammonia Refrigeration Manual*, Section 4.2, recommending that emergency shutdown procedures be written.
Failure to have a legible, permanent sign securely attached and easily accessible in any location on the ammonia refrigeration system displaying the following information: a) Name and address of the installer b) The refrigerant number and the	Failure to design and maintain a safe facility	Information provides critical information to those who are maintaining system.	IIAR Bulletin 109, Section 4.10.4 IIAR Bulletin 109, general safety checklist item (i) ANSI/ASHRAE 15-2013, Section 11.2.1 NFPA 1-2012, Section 53.2.4.1 (signage requirements include most, but not all, of the required information listed in column 1 of this table)[6] ANSI/IIAR 2-2014, Section 5.15 [among other emergency shutdown schematic drawings or signage, must have info. on quantity of ammonia in system, type and quantity of refrigerant oil in the system, and field test pressures applied]

[6] Section 53.14 in NFPA 1 (2006 ed.)

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amount of refrigerant in the system c) The lubricant identity and amount d) The field test pressure(s) applied			
The doors into the ammonia machinery room on the first and second floors were not tight-fitting and self-closing.	Failure to minimize the consequences of releases which do occur.	In the event of an ammonia release inside the machinery room, the failure to have a tight-fitting and self-closing door risks the spread of ammonia vapors outside the room. Also, it is more difficult for employees to escape the room when the door opens into the room rather than out.	ANSI/IIAR 2-2008 (Add. B., 2012 ed.), *Equipment, Design, and Installation of Closed-Circuit Ammonia Mechanical Refrigerating Systems*, Section 13.1.10.1 [Each refrigerating machinery room shall have a tight-fitting door or doors opening outward, self-closing if they open into the building, and adequate in number to ensure freedom for persons to escape in an emergency.] 13.1.10.3 [The refrigerating machinery room shall have a door that opens directly to the outside air or through a vestibule equipped with self-closing, tight-fitting doors equipped with panic-type hardware.] ANSI/IIAR 2-2014, Sections 6.10.1 [Machinery rooms exceeding 1,000 ft^2 must have at least two exit or exit-access doors, one of which can be served by a fixed ladder or alternating tread device, and all portions of a machinery room shall be within 150 ft of an exit]; and 6.10.2 [machinery doors shall be self-closing and tight fitting; doors that are part of the means of egress shall be equipped with panic hardware and side hinged to swing in the direction of egress; if machinery room does not have fire sprinklers then doors communicating with the building shall be one-hour fire rated; doors to outdoors shall be fire rated where required by the Building Code based on fire rating for exterior wall openings]. ANSI/ASHRAE 15-2013, *Safety Standard for Refrigeration System,* Section 8.12.d. [The refrigerating machinery room shall have a door that opens directly to the outdoors or through a vestibule equipped with self-closing, tight-fitting doors.]; 8.11.2 [Each refrigeration machinery room door shall have a tight-fitting door or doors opening outward, self-closing if they open to the building and adequate in number to ensure freedom for persons to escape in an emergency. With the exception of access doors and panels in air ducts and air handling units…there shall be no openings that will permit passage of escaping refrigerant to other parts of the building.]; Section 8.12.b [Doors

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			communicating with the building shall be approved, self-closing, tight-fitting doors.] IIAR's *Ammonia Refrigeration Manual*, Appendix A, item 11.14-11.18 at A10-42 [including questions about whether the doors are tight-fitting, open outward, and fitted with panic-type hardware; whether there are enough doors to ensure freedom to escape; and whether single exits are clear of any ammonia piping equipment or other obstructions]
The machinery room walls contained holes and gaps for piping and conduit that were not sealed from other spaces in the building.	Failure to minimize the consequences of releases which do occur.	Allows release of ammonia inside the machinery room to spread to other parts of the building, putting employees and responders at risk.	ANSI/ASHRAE-15(2013), Sections 8.11.2 […With the exception of access doors and panels in air ducts and air handling units…there shall be no openings that will permit passage of escaping refrigerant to other parts of the building.]; 8.11.7 [there shall be no air flow to or from an occupied space through a machinery room unless the air is ducted and sealed in a manner to prevent any refrigerant leakage from entering the airstream]; and 8.12(f) [All pipes piercing the interior walls, ceiling, or floor of such rooms shall be tightly sealed to the walls, ceiling, or floors through which they pass.] ANSI/IIAR 2-2008 (Add. B, 2012 ed.), Section 13.1.1.3 [Walls, floor, and ceiling shall be tight and of non-combustible construction – with exception from non-combustible construction requirement for buildings equipped with automatic sprinkler system]; Section 13.1.5.2 [All pipes piercing the interior walls, ceiling, or floor of machinery rooms shall be tightly sealed to the walls, ceiling, or floors through which they pass.] ANSI/IIAR 2-2014, Section 6.6.2 [Pipes penetrating the machinery room separation shall be sealed to the walls, ceiling, or floor through which they pass]; 6.2.5 Airflow from Occupied Spaces. Air shall not flow to or from any portion of a premises that is routinely accessible to or occupied by people on a part time or full-time basis through a machinery room unless the air is ducted and sealed to prevent ammonia leakage from entering the airstream. Access doors and panels in ductwork and air handling units located in a machinery room shall be gasketed and tight-fitting.] IIAR's *Ammonia Refrigeration Manual*, Appendix A, item 11.28 [Are all pipes piercing the exterior walls, ceiling or floor of the machinery room(s) tightly sealed….?]

Dangerous Condition	Potential GDC Violation	How Condition Could Lead to an Accidental Release or Exacerbate Consequences of a Release	Examples of Industry Standards of Care
The inspectors observed a significant amount of piping and equipment in the Ammonia Machinery Room, roof, and other ammonia-containing areas that was inadequately labeled or missing labeling indicating contents, physical state, and direction of flow. For example, the accumulators in the Ammonia Machinery Room were inadequately labeled.	Failure to design and maintain a safe facility taking such steps as are necessary to prevent releases. Failure to minimize the consequences of releases which do occur.	Makes it more difficult to: properly maintain system, operate correct valves, warn workers and emergency responders about hazards posed by system, reduce risk of human error in operating the system, and respond quickly in the event of a release. The risk was exacerbated at this facility by the co-location of some unmarked natural gas lines, some of which were confusingly painted the same color as the ammonia pipes.	IIAR Bulletin No. 109, *IIAR Minimum Safety Criteria for a Safe Ammonia Refrigeration System,* Section 4.7.6 [All ammonia piping should have appropriate pipe markers attached to indicate the use of the pipe and arrows to indicate the direction of flow, such as in IIAR Bulletin No. 114…]; IIAR Bulletin No. 114, *Identification of Ammonia Refrigeration Piping and System Components*; Sections 4.1 [Piping Markers: Piping markers shall be designed to identify the refrigerant, the physical state of the refrigerant, the relative pressure level of the refrigerant and the direction of flow]; 4.2 [Component Markers: Component markers will bear the name of the equipment they identify, e.g., RECEIVER, ACCUMULATOR, RECIRCULATOR and provide a pressure level designation.]. ANSI/IIAR 2-2008 (Add. B, 2012 ed.), *Equipment, Design, and Installation of Closed-Circuit Ammonia Mechanical Refrigerating Systems*, Section 10.6 [All piping mains, headers and branches shall be identified as to the physical state of the refrigerant (that is, vapor, liquid, etc.), the relative pressure level of the refrigerant, and the direction of flow. The identification system used shall either be one established as a standard by a recognized code or standards body or one described and documented by the facility owner.][7] ANSI/IIAR 2-2014, Sections 5.14.2 [refrigeration machinery shall be provided with labels]; 5.14.3 [emergency shutdown valves shall be clearly and uniquely identified at the valve itself and in the system schematic drawings]; 5.14.5 [ammonia piping mains, headers, and branches shall be identified with the following information: (1) "AMMONIA;" (2) physical state of the ammonia; (3) relative pressure level of ammonia, being low or high as applicable; (4) pipe service (can be abbreviated); and direction of flow. The marking system shall either be one established by a recognized model code or standard or one described and documented by facility owner.] ANSI/ASHRAE 15-2013, Section 11.2.2 [Systems containing more than 110 lbs of refrigerant shall be provided with durable signs…designating (a) valves or switches for controlling the refrigerant flow, the ventilation, and the refrigeration compressor(s); and (b) the kind of refrigerant or secondary coolant contained in exposed piping outside the

[7] This particular requirement was in Section 10.5 of the 2010 edition.

Dangerous Condition	Potential GDC Violation	How Condition Could Lead to an Accidental Release or Exacerbate Consequences of a Release	Examples of Industry Standards of Care
			machinery room. Valves or piping adjacent to valves shall be identified in accordance with *ANSI 13.1, Scheme for Identification of Piping Systems*.] IIAR's *Ammonia Refrigeration Manual,* Section 4.2 [Recommends labeling in accordance with Bulletin 114 as part of the facility's Standard Operating Procedure program]; ASME 13.1 (2007), specifying conventions for labeling piping
Main shut-off valves (King Valve) were not identified with a prominent sign.	Failure to design and maintain a safe facility taking such steps as are necessary to prevent releases. Failure to minimize the consequences of releases which do occur.	See above re. labeling of valves. Also, the king valve can be used to quickly shut off flow of ammonia from the ammonia receiver to the rest of the system. Any impediment to its use can lengthen the time of a release, endangering workers, emergency responders, and people off-site.	IIAR Bulletin No. 109, *IIAR Minimum Safety Criteria for a Safe Ammonia Refrigeration System,* Section 4.10.3 [The main shut-off valve(s) (king valve(s)); hot gas defrost line main shut-off valve; and NH_3 pump liquid main shut-off valve(s) and/or disconnects; of the ammonia system should be readily accessible and identified with a prominent sign having letters sufficiently large to be easily read.]; See also General Safety Checklist items (d) and (e). ANSI/ASHRAE 15-2013, *Safety Standard for Refrigeration Systems*, Section 11.2.2 [Systems containing more than 110 lbs of refrigerant shall be provided with durable signs…designating (a) valves or switches for controlling the refrigerant flow, the ventilation, and the refrigeration compressor(s).] ANSI/IIAR 2-2014, Sections 5.14.2 [Refrigeration machinery shall be provided with labels.]; 5.14.3 [Emergency shutdown valves shall be clearly and uniquely identified at the valve itself and in the system schematic drawings.]; NFPA 2-2012 Section 53.2.4.2 [Systems containing more than 110 lbs of refrigerant must have signs for main shutoff to each vessel, electrical controls, remote control valve, pressure limiting device.]
The company did not have tags or other documentation for pressure relief valves (PRVs) showing date of installation and	Failure to design and maintain a safe facility taking such steps as are	Makes it very difficult to judge whether valves are still functional. Pressure relief valves should be replaced or recalibrated every five years to ensure that they will function	ANSI/ASHRAE-15 (2013), Sections 10.1.1 and 10.2 [testing and declaration of test procedures applicable after complete installation and before operation] IIAR Bulletin 109, Section 4.9.7 [Pressure relief valves discharging to atmosphere should be replaced every five years of service.];

Dangerous Condition	Potential GDC Violation	How Condition Could Lead to an Accidental Release or Exacerbate Consequences of a Release	Examples of Industry Standards of Care
when they had been last inspected.	necessary to prevent releases.	properly. Old pressure relief valves can leak ammonia.	IIAR Bulletin 110 [June 19, 2007 revision of 6.6.3 re. replacement and recalibration of pressure relief valves] National Board Inspection Code Part 2 – Inspection (inspection requirements for pressure relief valves)
Access and Egress to/from Equipment and Room: Failure to provide a clear and unobstructed approach to refrigeration machinery for inspection, service, and emergency shutdown with adequate clearances for maintenance of equipment. For example, the pilot receiver pipe that broke in the March 23 release was in the way of the oil change point for the accumulator located behind the pilot receiver.	Failure to design and maintain a safe facility taking such steps as are necessary to prevent releases. Failure to minimize the consequences of releases which do occur.	Makes it very difficult to access machinery for proper preventative maintenance, risking an ammonia release from improperly-maintained equipment. Given the configuration of equipment and lack of support under oil drain pipes, these conditions could also lead to inadvertent breakage of these pipes. Likewise, emergency responders would have a hard time accessing equipment, which could increase the duration of a release. Also, the access/egress deficiencies put workers at risk in the event of an ammonia release.	ANSI/IIAR 2-2008 (Add. B, 2012 ed.), Section 13.1.2.2 [Requires a clear and unobstructed approach and space to refrigeration machinery for inspection, service, and emergency shutdown with adequate clearances for maintenance of equipment.] ANSI/IIAR 2-2014, Sections 6.3.1 [Machinery room equipment shall be located in such a manner as to allow egress from any part of the room in the event of an emergency and provide clearances required for maintenance, operation, and inspection according to manufacturer's instructions.]; 6.3.3.1 [Manually operated valves inaccessible from floor level shall be operable from portable platforms, ladders, or shall be chain operated.]; 6.3.3.2 [Manually operated isolation valves that are part of system emergency shutdown procedure shall be directly operable from floor or chain operated from a permanent work surface.]; 6.11 [Machinery rooms shall be equipped with light fixtures delivering a minimum of 30 foot-candles (320 lumens/m^2) at the working level, 36 in. (0.91 m) above a floor or platform and manual control for illumination sources shall be provided.] ANSI/ASHRAE 15 (2013), Sections 8.3 [A clear and unobstructed approach and space shall be provided for inspection, service and emergency shutdown of condensing units, compressor units, condensers, stop valves, and other serviceable components of refrigerating machinery.], Section 9.12.1 [All serviceable components of refrigerating systems shall be provided with safe access.]; IIAR Bulletin 109, Section 4.10.3 [The main shut-off valve(s) should be readily accessible….] and General Safety checklist, item e.

Dangerous Condition	Potential GDC Violation	How Condition Could Lead to an Accidental Release or Exacerbate Consequences of a Release	Examples of Industry Standards of Care
Also the Ammonia Machinery Room lacked safe access to the equipment on the roof, because the roof could only be accessed by an unsecured ladder placed precariously near the wooden steps leading downstairs. Also, at least one isolation valve on the pressure control receiver was located approximately eight to ten feet above ground level with no permanent platform or ladder or chain for operation to access the valve in the case of an emergency. Also, the Ammonia Machinery Room was very dark, making it difficult to see,			IIAR's *Ammonia Refrigeration Manual*, Appendix A, items 7.6 (accessibility of main valves), 11.5 (availability of platforms, ladders or chains for inaccessible valves), 11.33 (lighting) IMC 2009, Section 306.1 [Appliances shall be accessible for inspection, service, repair and replacement without disabling the function of a fire-resistance-rated assembly or removing permanent construction, other appliances, venting systems or any other piping or ducts not connected to the appliance being inspected, serviced, repaired or replaced. A level working space at least 30 inches deep and 30 inches wide shall be provided in front of the control side to service an appliance]

Dangerous Condition	Potential GDC Violation	How Condition Could Lead to an Accidental Release or Exacerbate Consequences of a Release	Examples of Industry Standards of Care
inspect, and move around equipment. Finally, access to and egress from the ammonia machinery room itself was unsafe. The only access and egress was up wooden, combustible stairs, and the upstairs door leading to open air had no steps or adequate protection to prevent someone from falling to the ground.			
There was excessive ice buildup on refrigeration piping, the Control Pressure Receiver, and valves in the Ammonia Machinery Room	Failure to design and maintain a safe facility taking such steps as are necessary to prevent releases.	Ice buildup can obscure valves and weigh down components, risking collapse and ammonia release and making it difficult to turn off components. It also exposes pipes to moisture, which can cause corrosion and pipe failure.	ANSI/IIAR 2-2008 (Add. B, 2012 ed.), Section 10.4.1 [Piping hangars and supports shall carry the weight of the piping, as well as any other anticipated loads. Example: refrigerant weight, insulation, frost/ice, seismic/wind loads, personnel, etc.] ANSI/IIAR 2-2014, Sections 13.4.1 & App. F [Piping hangars shall carry the weight of the piping and any additional expected loads; maximum hangar rod loading tables]; App. A, A.13.4.1 [examples of loads include ammonia weight, insulation, frost, ice, seismic, wind, and thermal]; 5.10.1 [Piping and equipment surfaces not constructed of corrosion-resistant materials or protected with corrosion-resistant treatment and not intended for heat exchange shall be insulated, treated, or otherwise protected to mitigate condensation and excessive frost buildup; piping and fittings constructed of corrosion-resistant materials or protected with a corrosion-resistant treatment must be routinely

Dangerous Condition	Potential GDC Violation	How Condition Could Lead to an Accidental Release or Exacerbate Consequences of a Release	Examples of Industry Standards of Care
			defrosted or otherwise managed to limit ice accumulation if not insulated; if defrost method of ice control used then must provide means to control and drain condensate] IIAR Bulletin 109, Section 4.10.7 [Ice formations that could endanger refrigerant piping or other components should be removed and the condition(s) that caused the ice build-up corrected.]; General safety checklist, item (s) ANSI/ASHRAE 15 (2013), Section 11.6 [Refrigerating systems shall be maintained by the user in a clean condition, free from accumulations of oily dirt, waste, and other debris, and shall be kept accessible at all times.] IIAR Bulletin 110, Section 6.7 [re. piping maintenance]
Failure to safeguard piping, valves, and other system components adequately from accidental damage or rupture by external sources. For example, in the Ammonia Machinery Room, drain lines extending from tanks into walkways were not supported or protected from physical impact. In Cooler Room A, the inspectors	Failure to design and maintain a safe facility taking such steps as are necessary to prevent releases.	Risks ammonia release from accidental damage to system components.	ANSI/ASHRAE 15 (2013), Section 11.1 [Means shall be taken to adequately safeguard piping, controls and other refrigeration equipment to minimize possible accidental damage or rupture due to external sources.] ANSI/IIAR 2-2014, Sections 5.17.1 [Guarding or barricading shall be provided for ammonia-containing equipment installed in a location subject to physical damage.]; 13.4.2 [Refrigerant piping shall be isolated and supported to prevent damage from vibration, stress, corrosion, and physical impact.] IIAR Bulletin 109, Section 7 Inspection Checklists for evaporators, item g (adequate protection against traffic hazards?), piping item b Ammonia Refrigeration Manual, Appendix 10.1, item 8.10 [Is all piping protected from traffic hazards such as fork lifts?] IMC 2009, Section 1107.2 [Refrigerant piping that crosses an open space that affords passageway in any building shall be not less than 7 feet 3 inches above the floor unless the piping is located against the ceiling of such space.].

Dangerous Condition	Potential GDC Violation	How Condition Could Lead to an Accidental Release or Exacerbate Consequences of a Release	Examples of Industry Standards of Care
observed pallet racks installed near the ceiling and directly underneath ammonia piping and evaporator units. The inspectors observed a damaged drainage pan under one of the Cooler Room A evaporators, indicating that a forklift or other equipment had run into the pan. The inspectors also observed a low unprotected liquid trap on ammonia piping running above one of the loading dock bays. The temporary refrigeration piping and electrical cords running across the floor in the loading dock area present a trip hazard for			

Dangerous Condition	Potential GDC Violation	How Condition Could Lead to an Accidental Release or Exacerbate Consequences of a Release	Examples of Industry Standards of Care
employees working in the area.			
The facility has more than 500 lbs. of anhydrous ammonia and had not submitted 2015 chemical inventory reports to the Boston Fire Department or the Boston Local Emergency Planning Committee. Nor had these reports ever included sulfuric acid or lead.	Failure to minimize releases that do occur. Also an EPCRA violation.	Lack of coordination with fire department and other emergency responders may impede proper emergency response.	40 C.F.R. § 370.10
The facility had a computerized panel to help control the refrigeration system, but it appeared not to be properly calibrated, as it read out the wrong time. Also, the interlocks triggered by the ammonia detector had been disabled since January 2016,	Failure to design and maintain a safe facility taking such steps as are necessary to prevent releases. Failure to minimize the consequences of releases	This computerized system was intended to provide an extra measure of safety to monitor performance of the system and, in the case of an ammonia leak, turn on ventilation, activate alarms and shut down compressors.	IIAR Bulletin 109, IIAR Minimum Criteria for a Safe Ammonia Refrigeration System, Section 4.10.1 [All installed instruments should be in working order. Inaccurate or broken instruments should be replaced.] IIAR Bulletin No. 110 *Startup, Inspection and Maintenance of Ammonia Mechanical Refrigerating Systems,* Section 6.6.4 Sensing Devices, Monitoring Devices, Sensors, Alarms, Interlocks, and Emergency Shutdown Systems: These devices or systems may take the form of pressure, temperature or level-operated switches or controls, Bourbon tube pressure gauges, or ammonia vapor detectors. It also includes remote level indicators, data collection systems, annunciators, or other automatic devices connected to these other devices. Manufacturer's instructions for inspection, testing, calibration, and overhaul shall be followed. At least annually, safety cutouts shall be tested. Pressure gauges used in the testing of any safety cutouts shall be calibrated.]

Dangerous Condition	Potential GDC Violation	How Condition Could Lead to an Accidental Release or Exacerbate Consequences of a Release	Examples of Industry Standards of Care
such that a detection of high ammonia levels would not automatically turn on ventilation, activate alarms, or shut off machinery.	which do occur.		
Lack of proper eyewash and safety showers inside or immediately outside the Maintenance/ Ammonia Machinery Room There was an eyewash station (without a safety shower) at the bottom of the wooden stairs, but it would not have been easily accessible by a worker in the machinery room upstairs. When Mr. Wallace tapped on the gravity-feed eyewash station during the May 24, 2016 inspection, it	Failure to minimize the consequences of releases which do occur.	Makes it difficult for emergency responders and workers to safely respond to releases and wash off this corrosive, toxic chemical in the event of exposure.	ANSI/IIAR 2-2008 (2012 ed.), Equipment, Design, and Installation of Closed-Circuit Ammonia Mechanical Refrigerating Systems, Section 13.1.6 [An eyewash and body shower unit shall be located external to the machinery room and readily accessible via an exit.] ANSI/IIAR 2-2014, Section 6.7 [Eyewash/Safety Shower. 6.7.1 General. Each machinery room shall have access to a minimum of two eyewash/safety shower units, one located inside the machinery room and one located outside of the machinery room, each meeting the requirements in Section 6.7.3. Additional eyewash/safety shower units shall be installed such that the path of travel in the machinery room is no more than 55 ft to an eyewash/safety shower unit. 6.7.2 Path of Travel. The path of travel within the machinery room to at least one eyewash/safety shower unit shall be unobstructed and shall not include intervening doors. 6.7.3 Installation Standard. Emergency eyewash/safety shower unit installations shall comply with ANSI/ISEA Z358.1]

Dangerous Condition	Potential GDC Violation	How Condition Could Lead to an Accidental Release or Exacerbate Consequences of a Release	Examples of Industry Standards of Care
sounded hollow (i.e., without much water).			
The floor drains in the Maintenance/ Ammonia Machinery Room did not have means to prevent the entry of spilled materials such as oil and ammonia. The drains are connected with the storm drain system, which may lead to Boston Harbor.	Failure to minimize the consequences of releases which do occur.	The refrigeration system contains both ammonia and oil, so it is foreseeable that both substances could be released into the water, causing environmental damage and exacerbating the negative consequences of any releases that do occur.	ANSI/IIAR 2-2014, Section 6.9 Drains. [6.9.2 Contaminant Control. Where a drainage system is not designed for handling oil, secondary coolants, or other liquids that might be spilled, a means shall be provided to prevent such substances from entering the drainage system. 6.9.3 Control of Ammonia Systems. A means shall be provided to limit the spread of a liquid ammonia spill into the machinery room drainage system.] ANSI/ASHRAE 15-2013, Section 11.3: [….Except for the discharge of pressure relief devices and fusible plugs, incidental releases due to leaks, purging of noncondensables, draining oil, and other routine operating or maintenance procedures, no refrigerant shall be discharged to the atmosphere or to locations such as a sewer, river, stream or lake.] Section 301(a) of the Clean Water Act, 33 U.S.C. § 1311(a), prohibits discharging pollutants through a point source to a water of the United States without a permit.
The windsock observed on the building could not be seen from multiple locations around the facility.	Failure to minimize the consequences of releases which do occur.	Properly placed windsocks help minimize the consequences of releases that do occur by helping emergency responders understand what direction the wind may be carrying toxic ammonia plumes. They can issue shelter-in-place orders or muster evacuees accordingly.	40 C.F.R. § 1910.119 Appendix C -- Compliance Guidelines and Recommendations for Process Safety Management (Nonmandatory): [….For outdoor processes where wind direction is important for selecting the safe route to a refuge area, the employer should place a wind direction indicator such as a wind sock or pennant at the highest point that can be seen throughout the process area. Employees can move in the direction of cross wind to upwind to gain safe access to the refuge area by knowing the wind direction…]. ANSI/IIAR 2-2014, Section 5.14.6 [Where a sock, pennant or other wind indicator is provided, it shall be in accordance with specifications and locations prescribed by emergency planning documents.] IIAR's Ammonia Refrigeration Manual, Appendix 10.1, Hazard Review Checklist, item 11.22 at A10-43 [Is a windsock or some other means of indicating wind direction provided at the facility?]

Dangerous Condition	Potential GDC Violation	How Condition Could Lead to an Accidental Release or Exacerbate Consequences of a Release	Examples of Industry Standards of Care
The Fish Cutting Room is in an enclosed space within Cooler Room A but does not contain an ammonia detector. Because the room is enclosed, the ammonia detector in Cooler Room A near the ceiling in the center of the room would not provide adequate warning of an ammonia release and presents a hazard to employees working in the Cutting room.	Failure to design and maintain a safe facility taking such steps as are necessary to prevent releases. Failure to minimize the consequences of releases which do occur.	Ammonia detectors and alarms provide early warning that a release is taking place, enabling quick response to stop the release and protecting workers, emergency responders, and the public from a larger release.	ANSI/IIAR 2-2014, Section 7.2. [*Requirements for Nonmachinery Room Spaces*, specifically 7.2.3 which provides – with key exceptions – that Level 1 detection and alarm shall be provided in accordance with 17.7.1 and that the detection/alarm system shall comply with Chapter 17]; 17.4 [detectors shall be mounted in position where ammonia from a leak is expected to accumulate]; 17.7.3 [additional requirement that level 3 alarm shall activate system to close control valves and de-energize refrigerant pumps, nonemergency fans and other motors]; 17.5 [audible alarms shall provide sound pressure level of 15 decibels (dBA) above average ambient sound level and 5 dBA above maximum sound level of the area]
The copper water piping around the ammonia feed line to the evaporator in the Fish Cutting Room was oxidized with a bluish-green patina, indicating that ammonia may have been leaking from the refrigeration valves or piping at	Failure to design and maintain a safe facility taking such steps as are necessary to prevent releases. Failure to minimize the consequences	Leaking valves or piping could lead to a release of ammonia, endangering employees. Also, a small, slow leak could get worse if not addressed.	IIAR Bulletin 109, Section 4.10.8 [If an ammonia leak is observed, the source of the leak should be investigated and the leak repaired.] IMC 2009, Section 1101.7 [Mechanical refrigeration systems shall be maintained in proper operating condition, free from accumulations of oil, dirt, waste, excessive corrosion, other debris and leaks.]

Dangerous Condition	Potential GDC Violation	How Condition Could Lead to an Accidental Release or Exacerbate Consequences of a Release	Examples of Industry Standards of Care
some point in the past.	of releases which do occur.		
One of the support legs on an icemaker in Cooler Room B was not bolted to the floor.	Failure to design and maintain a safe facility taking such steps as are necessary to prevent releases.	Adequate supports can prevent ammonia system machinery can prevent detrimental vibration or movement that might make the equipment fail and release ammonia.	IIAR 2-2008 (Add. B) Section 14.4.1 [Supports and foundations shall be adequate to prevent detrimental vibration, movement and any site-specific external loads.]
Inadequate emergency action plan.	Failure to minimize the consequences of releases which do occur.	Can impede a swift, safe emergency response and thus increase risks to workers, emergency responders and people off-site.	IIAR's *Ammonia Refrigeration Management Program* Section 7 (2005): Refrigeration facilities should develop an up-to-date, facility-specific emergency action plan that accurately describes the facility and the potentially affected population. Such a plan should include, among other items: types of evacuation, evacuation procedures and routes, procedures for employees who remain to maintain critical operations, procedures for accounting for evacuated employees, any employee rescue and medical duties, and means for reporting emergencies. An adequate emergency response program should also identify procedures for responding to an ammonia release, including shutting the system down, starting emergency ventilation, and coordinating with all relevant off-site emergency responders. See also EPA's *Guidance for Implementation of the General Duty Clause Clean Air Act Section 112(r)(1),* available at http://www.epa.gov/oem/docs/chem/gdcregionalguidance.pdf

U.S. ENVIRONMENTAL PROTECTION AGENCY

Region 1

EPCRA and CAA 112(r) Inspection Report

Date: June 15, 2016

From: Leonard Wallace IV, Enforcement Officer

Through: Mary Jane O'Donnell, Manager, RCRA, EPCRA, and Federal Programs Unit

To: File

Subject: Chemical Accident Investigation and Inspection, under Emergency Planning and Community Right to Know Act (EPCRA) Sections 302 – 312, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 103, and Clean Air Act (CAA) Section 112(r), of Stavis Seafoods, Inc, Boston, MA 02210

I. GENERAL INFORMATION

Facility Name: Stavis Seafoods, Inc. (Stavis Seafoods)

DUNS Number: 83-181-7353—for 7 Channel Street Facility.
00-196-6472—for 212 Northern Avenue office.

Facility Address: 7 Channel Street, Boston, MA 02210
Corporate Address: 212 Northern Avenue, Suite 305, Boston, MA 02210

EPA Inspector Names:
Leonard B. Wallace IV, U.S. Environmental Protection Agency (EPA) Region 1
James Valentine, U.S.EPA Region 1/Senior Environmental Employment Program (SEE)
David F. Oberhauser, U.S.EPA Region 1/SEE

Inspection Date: March 24, 2016

Type of Inspection: Accident Investigation, EPCRA 302 – 312, CERCLA 103, CAA 112(r)

Purpose of Inspection: The inspection was initiated because of an anhydrous ammonia release and fatality on March 23, 2016 at the Stavis Seafoods facility to evaluate compliance of the facility with Emergency Planning and Community Right to Know Act (EPCRA) Sections 302 - 312, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 103, and Clean Air Act (CAA) Section 112(r) including the Risk Management Program (RMP) and the General Duty Clause (GDC).

Current Property Owner: Economic Development and Industrial Corporation of Boston

Current Business Owner and Operator: Stavis Seafoods, Inc. and Stavis Seafoods Limited Partnership

Primary NAICS codes: 424460-Fish and Seafood Merchant Wholesalers

Estimated Annual Sales: $203 million (Hoovers, March 24, 2016 report)

Relationship to other firms, parent corporation, subsidiaries, and location of off-site facilities: Stavis Seafoods, Inc. has corporate offices located at 212 Northern Avenue, Boston, MA 02210.

II. GENERAL DESCRIPTION OF FACILITY

The Stavis Seafoods facility is located in Boston, Massachusetts at the Marine Industrial Park area, and is a processing and distribution facility for fresh and frozen seafood products. The company has approximately 120 full-time employees at its 7 Channel Street facility, its corporate office located nearby at 212 Northern Avenue, Boston, MA and its other facilities.

The facility uses anhydrous ammonia in its refrigeration system to provide cooling capabilities. The refrigeration process cycles anhydrous ammonia through gas and liquid physical states to provide refrigeration for freezing of incoming fresh seafood and for storage of fresh and frozen products. According to information provided by Stavis Seafoods representatives, the total amount of ammonia on site was 5,400 pounds. That amount of ammonia in the system was based on calculations done by American Refrigeration Company on September, 2009 on behalf of Stavis Seafoods. Mr. Michael Sirois, President of American Refrigeration Company stated he would make available a copy of the ammonia system calculations.

At ambient pressure and temperature, anhydrous ammonia is a clear, colorless gas with a strong odor. It is often stored and shipped under pressure as a liquid. As a gas it is generally regarded as nonflammable, but with strong ignition it does burn within certain vapor concentration limits. It is corrosive and is an inhalation hazard (acute and chronic).

III. IN-BRIEF/OPENING CONFERENCE

At approximately 9:00 AM on March 24, 2016, the EPA inspectors met representatives of the Boston Fire Department, Boston Police Department, OSHA, Massachusetts Department of Public Safety, Massachusetts Department of Public Health, and Massachusetts Environmental Police representing the Massachusetts Attorney General's Office, and Stavis Seafoods management and their supporting contractors, at the 7 Channel Street, Boston, MA facility.

EPA Names:

Leonard B. Wallace IV, U.S. Environmental Protection Agency (EPA) Region 1
James Carew, U.S. EPA Region 1
David F. Oberhauser, U.S. EPA Region 1/Senior Environmental Employment Program (SEE)
James Valentine, U.S. EPA Region 1/SEE

The following individuals signed in on the roster sheet and were present at the Opening Conference and/or the Closing Conference.

Art Antczak	Operations Manager	Stavis Seafood	aantczak@stavis.com	617-482-6349
Salvatore Armata	Refrigeration Technician	American Refrigeration Company	sarmata@americanrefrigeration.net	781-953-8962
Andrew Beaulieu	Detective Sargent	Massachusetts Environmental Police	andrew.beaulieu2@state.ma.us	617-963-2650

Terrence Burke	Haz-Mat Technician	Boston Police Department	terrence.burke@pd.boston.gov	617-343-6057
Jack Dempsey	Deputy Fire Chief	Boston Fire Department		617-343-3402
Joe Dimeco		American Refrigeration Company	jrdimecojr@hotmail.com	781-953-8962
Mary Fleming	Treasurer and CFO	Stavis Seafood	mfleming@stavis.com	617-482-6349
Gary Hardin	Regulatory Affairs Manager	Stavis Seafood	ghardin@stavis,com	617-590-7668
Salvatore Insogna	Compliance Officer	OSHA	insogna.salvatore@dol.gov	617-565-6924
Kenneith Jones	Haz-Mat Specialist	Boston Fire Department	kenneith.jones@boston.gov	617-343-2195
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Steven McGillis	Capitan	Boston Fire Department	steven.mcgillis@boston.gov	617-719-8768
James McPartlin	Assistant Operations Manager	Stavis Seafood	jmcpartlin@stavis.com	617-482-6349
Jeremy Okwuosa	Director of Quality Assurance	Stavis Seafood	jokwuosa@stavis.com	617-897-1248
John Racioppi	Supervisory Food and Drug Inspector, Seafood Inspection Unit	Department of Public Health	john.racioppi@state.ma.us	617-983-6748
Carlos Rita	Service Manager	American Refrigeration Company	crita@americanrefrigeration.net	978-474-4000
Kenneth Shedden	Area Director	OSHA	shedden.kenneth@dol.gov	978-490-4627
Michael Sirois	President	American Refrigeration Company	msirois@americanrefrigeration.net	978-474-4000

Enforcement Officer Leonard Wallace IV described the purpose of the inspection, and then presented his credentials and the Notice of Inspection to the representative of Stavis Seafoods, Art Antczak, Stavis Seafoods Operations Manager, who signed the Notice of Inspection as recipient on behalf of the company at 9:35 AM. Mr. Antczak did not attempt to deny facility entry to the inspectors, nor did he invoke any claims of Confidential Business Information (CBI) for purposes of the inspection.
Mr. Wallace provided a copy of each of the following documents to the Stavis Seafoods representatives:

a. EPCRA fact sheet (EPA 550-F-12-002 September 2012).
b. Massachusetts 2016 Tier 2 Submit Contact information.
c. List of Lists (EPA 550-B-15-001, March 2015).
d. Small Business Resource Information Sheet (EPA 300-F-11-006 June 2011).
e. *National Response Center & Chemical Spill Reporting* flyer.
f. *Chemicals in Your Community* brochure (EPA 550-K-99-001 December 1999).

Mr. Wallace asked if anyone from Stavis Seafoods had called the National Response Center (NRC) about the ammonia and oil releases that accorded on March 23, 2016. The Stavis Seafoods representatives all responded in the negative. Mr. Wallace explained that the law requires that Stavis Seafoods should have immediately notified the National Response Center about the ammonia and oil releases and that their obligation to report this event is not satisfied until someone from the company makes the call to the National Response Center.

Each agency present explained to the group, including Stavis Seafoods representatives and their supporting contractors, why they were there.

IV. PHYSICAL INSPECTION

General Inspection

The inspection consisted of a walk around the facility exterior and inside the facility's Maintenance Storage/Ammonia Machinery Room area located on the Massport Haul Road and Alleyway corner of the facility. During the Inspection, EPA inspectors were accompanied by representatives from the several agencies mentioned above as well as representatives of the facility. The facility representatives who participated in the inspection responded to EPA's inquiries.

The facility building was segmented into several areas. They were: the Cooler A (Fish Cutting Room); Public Retail area; Freezer; Cooler B (Jack Room) (Transportation Security Administration - TSA holding Area); a truck loading dock area; Maintenance (first floor)/Ammonia Machinery Room (Second floor); and Office/Cafeteria/Conference area.

The facility's Maintenance/Storage Room area is on the first floor and the Ammonia Machinery Room (AMR) is on the second floor directly above the Maintenance/Storage Room area. An aluminum ladder leads from Ammonia Machinery Room to additional ammonia machinery and piping on the roof of the building. (See Photo 2 for building area with blue doors on two floors). The inspectors also walked the exterior area of the facility. The walk-through focused on areas in the Maintenance/Storage Room area and Ammonia Machinery Room area where the Ammonia release and fatality occurred. We were unable to access the roof of the facility due to the unsafe aluminum ladder setup to the roof from the AMR.

Mr. Oberhauser and Mr. Wallace took a total of 170 digital photographs (photos) of selected equipment and locations during the inspection to provide reference documentation of conditions observed during the inspection. A photo documentation log of these photos is attached to this report, and the photos will be

referenced throughout the document. The inspectors did not collect any samples during the inspection. The scene was initially considered a potential crime scene due to the fatality but, by the afternoon of the inspection, the Boston Police stated that this was now considered an industrial accident. The Boston Fire Department took possession of the piping and valve from the Pilot Receiver in the afternoon after the completion of the inspection. (See Photos 59 and 60). This is the pipe and valve that were involved in the ammonia release.

Mr. Brian Caron of Stavis Seafoods was the overall Program Manager of the Ammonia Refrigeration Management (ARM) Program. Mr. Caron was found deceased near the Pilot Receiver located in the Ammonia Machinery Room by the Boston Fire Department Haz-Mat Team during the ammonia release on March 23, 2016.

Stavis Seafood had a maintenance contract for the ammonia refrigeration system with American Refrigeration Company, Inc. (American Refrigeration), Andover, MA. According to the facility management, American Refrigeration would perform more significant maintenance on the ammonia system only when called by Stavis Seafoods. When Mr. Wallace inquired further about the routine ammonia system maintenance schedule, a Stavis Seafoods representative indicated that American Refrigeration was only called in on an as-needed basis.

An American Refrigeration employee heard about the ammonia leak on the radio when driving home and went directly to Stavis Seafoods and reported to the Boston Fire Department Haz-Mat Team to help with the shutdown of the ammonia system.

Mr. Wallace requested a copy of the facility's 2015 EPCRA Tier 2 report which was required to be submitted by the March 1, 2016 by the facility to the Boston Fire Department and Boston Local Emergency Planning Committee (LEPC). The Boston Fire Department had no record of the 2015 Tier 2 being submitted to them for either the Boston Fire Department or the Boston Local Emergency Planning Committee. Stavis Seafoods representatives were asked to send a copy of the 2015 Tier 2 form plus any documents showing when it was submitted to the Boston Fire Department and the Boston Local Emergency Planning Committee.

Inspector Wallace requested a copy of the current Piping & Instrumentation Diagram (P&ID) for the anhydrous ammonia refrigeration system. Stavis Seafoods representatives informed us that it was upstairs in the Ammonia Machinery Room on the back of the Double Blue doors.

Mr. Wallace asked if the facility had conducted a Process Hazard Analysis (PHA) for the ammonia refrigeration system and Mr.Hardin, Stavis Seafoods, Regulatory Affairs Manager, believed it was part of the Ammonia Refrigeration Management Program. Mr. Wallace then requested copies of Standard Operating Procedures (SOPs), Maintenance Schedules/Programs, Emergency Response Plans, and Employee Training Records associated with the ammonia system. The Stavis Seafoods representatives said this information would be available in Mr. Caron's office area or on the company computer network.

In response to the above inquiry regarding the operating and safety documents, the following electronic documents from Stavis Seafoods Inc. were collected on a USB Flash Drive by Kenneth Shedden, OSHA who then shared them with the US EPA. The following is a list of the electronic documents collected from Stavis Seafoods Inc:

Ammonia Refrigeration Management Program Management System dated 07/22/2013
Appendix A Emergency Response Plan for Ammonia
Emergency Preparedness Program
Building Evacuation/Fire Emergency Plan (building diagram)

Mr. Caron: 8 Hour Refresher Course Technician Level, March 21, 2015
24 Hours Haz Mat Technicians October 20-22, 2010
Industrial Refrigeration Operator I, August 15-18, 2011
Industrial Refrigeration Operator II, July 30 - August 2, 2012

To understand the building layout, we requested a simple footprint type drawing of the facility. Stavis Seafoods representatives supplied a copy of the Building Evacuation/Fire Emergency Plan drawing, for everyone and then explained they had renamed the following areas on the drawing they just gave us. They renamed Area A to Cooler B; Area B to Freezer and Area C to Cooler A.
The inspectors noted the facility was located in a mixed commercial/industrial area, but was within approximately 700 feet of hotel properties. There were travel trailers for the employees of the Big Apple Circus just 300 feet away on Channel Street.

The ammonia system operates 24 hours a day, seven days a week. During non-work hours, there is no one who is trained to operate the ammonia system present on site.

Mr. James McPartlin, Assistant Operations Manager, Stavis Seafoods Inc, explained to the group the sequence of events from the early evening of Wednesday March 23, 2016. According to Mr. McPartlin, he thought there were only 3 other workers in the building besides himself at the time of the initial notification of an ammonia odor. Just before 6:00 PM, one of the warehouse workers, Antoni (no one from Stavis Seafoods knew how to spell the last name of Antoni), was working in Cooler B and went to Mr. Ed Bishop, Transport, to report the odor of ammonia. They then notified Mr. McPartlin of the ammonia odor who then ordered everyone out of the building. Once outside of the building, Mr. Jose Melgar, the cleaning person, reported to Mr. McPartlin that Mr. Caron might still be in the building because his truck was in the alleyway. Mr. McPartlin went to the entrance door of the Maintenance/Ammonia Machinery Room in the alleyway and attempted to enter the Maintenance/Ammonia Machinery Room door, but he was unable to enter the door because of the ammonia fumes.

Mr. McPartlin was about to make the 911 call when the first Boston Fire Department truck pulled up. EPA later learned that anonymous caller from the area had called to report an odor.

<u>Alcove/Alleyway Area</u>
These are the inspector's observations for this area:

(a) There was a pickup truck parked in the alleyway which belonged to Mr. Brian Caron. (See Photos 6, 7, 12, 15, 139 & 142).

(b) On the outside corner of the Maintenance/Ammonia Machinery Room the natural gas line was observed coming out of the ground and going up the side of the building. The natural gas line was not labeled. The natural gas line had four bollards around it. One of the bollards was bent towards the Maintenance/Ammonia Machinery Room door. (See Photos 7 & 11).
When the natural gas line made the turn on to the roofs it was painted yellow as seen in Photos 1 and 3.

(c) In photos 11, 12 and 19 a natural gas line was seen mounted on the outside wall that starts at the Maintenance/Ammonia Machinery Room and runs all the way around to the brown painted part of the building which holds some of the offices. The natural gas line did not have an appropriate label. In photo 19 the pipe just below the natural gas line is not marked and is covered in some type of white and silver wrapping. No one from Stavis Seafoods was sure what substance the pipe held.

(d) The exterior double door leading to the two-story Maintenance/Ammonia Machinery Room lacked a tight seal (See Photos 16 & 18). The bottom of the doors had a brush type strip and the concrete sill was degraded as seen in photos 8 and 16. The door lacked a proper NFPA sign to indicate the presence of ammonia and the door lacked adequate signage to indicate that only authorized personnel could enter. (See Photo 10). There were no Emergency Procedures posted.

(e) A sign on the storm drain near the exterior door to the Maintenance/Ammonia Machinery Room indicated that it led directly to Boston Harbor. (See Photos 8 and 11). According to Mr. Roumauld Boyens, Stavis Seafoods, the floor drains in the Maintenance/Ammonia Machinery Room drain are connected to the outside storm drain in the alcove area. Mr. Boyens then went and made a photocopy of the floor drain system diagram on which he had hand drawn the floor drain lines.

(f) The facility had one wind sock on the building. It was located on the corner of the alleyway and Channel Street. The wind sock appeared to be less than 3 meters above the roof line. (See Photos 13 &14). This wind sock had limited visibility from other parts of and approaches to the building.

(g) An Emergency Control Box was outside to the left of the Maintenance/Ammonia Machinery Room door. According to Stavis Seafoods management there was only one key to enable access to the Emergency Control Box and Mr. Caron was responsible for the key to this control box. See photos (16 &17). The Boston Fire Department forced open the control box without the key to access the controls and then the Boston Fire Department pushed the Red Button, labeled on top "Emergency Stop" and underneath the Red Button "Emergency Refrigeration Equipment Power Off". The Black switch has two labeled positions above the switch - left "AUTO" and the right side "HAND". The Black switch was set on HAND when the Boston Fire Department arrived on scene and it remained in that position. Underneath the Black switch was a red label "Emergency Refrigeration Room Exhaust Fans On". (See Photo 21).

(h) Above and to the left of the Maintenance/Ammonia Machinery Room door was a red colored external visual alarm. The alarm was not properly labeled to indicate whether it would signal an ammonia release. (See Photos 11&12). On the mounting bracket facing towards the ground was a red label which read "Refrigeration Emergency" (See Photos 22 & 23).

(i) There is no Audio alarm for notification of an ammonia release.

<u>Maintenance /Storage Room</u>

The inspectors entered the first floor of the Maintenance/Storage Room. This first floor consisted of a general storage and maintenance room plus several mechanical systems. For general views of the storage/maintenance room, see Photos 24-49. Issues identified in this general storage and maintenance room included:

(a) Many different containers of products and materials were co-located in this area. (See Photos 24, 25, 27, 33 and 43). To the right of the wooden steps was a red drum of Mobil Gargoyle Arctic Oil 300, which had no secondary containment. On top of the red drum of Mobil oil was an open plastic container with a chemical product in it as seen in Photo 26. Just behind and a little to the left of the red oil drum is a pallet with boxes containing various chemical products hazardously stacked. (See Photos 26 & 27). In photo 27 in a brown box inside a white box on a pallet you can see a quart of oil with a small green tank of propane

and other chemical products in the same box. Seen in photo 33 in the back right corner of the room there are metal shelving units holding various aerosol cans and other chemical products.

(b) Inside the Chemical Cage was a yellow Flammable Storage Cabinet, see photo 25. Both Mr. Wallace and Mr. Shedden, OSHA, observed that the flammable cabinet was not grounded.

(c) The Glycol system, which is part of the ammonia system, was unlabeled. The glycol system which goes under the refrigerated floors is shown in Photos 32 & 44). No one knew the amount of or the type of glycol in the system.

(d) There was one eye wash station in the Maintenance/Ammonia Machinery Room area on the first floor at the bottom of the wooden steps. It was a gravity fed wall-mounted eye wash station unit. (See Photos 24, 45, 46 & 47). When Mr. Wallace tapped the eye wash station, it sounded empty.

(e) There were wooden stairs going up to the second floor Ammonia Machinery Room area. Stored under the wooden stairs were salt bags on a wooden pallet. (See Photos 24 & 27). Underneath the wooden steps Stavis Seafoods also had a mechanical pump system for delivering chemicals to the hot water system which is up on the second floor. (See Photos 31, 48 & 49). In photo 49 is a blue plastic drum unlabeled as to what it contents are. This blue drum was connected to one of the mechanical pumps. On top of the blue drum was another small container of chemical product. The Algaecide #41 and Microbicide 61 white plastic pails have pump hoses going into the open pour spouts, which were unsecured.

(f) The wooden steps in Photos 27, 28 and 29 go to the Ammonia Machinery Room area and these wooden step were the only way to access the Ammonia Machinery Room area on the second floor. At the top landing is an aluminum ladder, which was intended as an access to the roof. Mr. Wallace observed the aluminum ladder was close to the edge of the top landing in Ammonia Machinery Room area and was in the way of getting on and off the steps. The EPA inspectors did not access the roof during this inspection.

Ammonia Machinery Room (AMR)

The inspectors continued up the wooden steps to the second floor to the Ammonia Machinery Room area. The second floor consisted of the Ammonia Machinery Room, which contains two high pressure receivers. General views of this area are presented in Photos 50, 51, 52, 101 &193.

The two high pressure receivers, one painted yellow and labeled Pilot Receiver and one white insulated receiver labeled Control Pressure Receiver are seen in photo 55.

The inspector's observations for this area are as follows:

(a) A short pipe and valve on the bottom of the Pilot Receiver had failed, which resulted in the ammonia system releasing significant quantities of anhydrous ammonia and oil. The Stavis Seafoods representatives estimated that the release included all or nearly all of the facility's 5,400 pounds of ammonia. Oil from the Pilot Receiver had sprayed throughout the room from ceiling to floor. The oil covered equipment, table and pipes are seen in Photos 56, 57, 58, 59, 60, 61, 70, 71, 72 and 125.

At the base of the Pilot Receiver on the left hand side on the bottom of the tank is a short pipe with a hand valve and threaded plug at the end as seen in Photos 59 and 60. Photos 61 and 63 show where the pipe broke, just below where the pipe was threaded into the tank. The valve and pipe we're not supported and the valve assembly did not have a spring-loaded closer valve on it for draining oil materials from the Pilot Receiver tank see Photo 60.

The Pilot Receiver was built in 1984 based on the date stamped on the U plate. There is no National Board number stamped on the U plate. Where the National Board number is usually stamped, "NA" is stamped as seen in Photo 119.

The Pilot Receiver isolation valve(s) (King Valve(s)) was/were not marked as seen in Photo 58.

(b) According to Kenneith Jones, Haz-Mat Boston Fire Department, Mr. Caron's body was found in front of the Pilot Receiver area, next to the oil pot drain and white tub of oily liquid. The tub of oil is under the oil pot drain for the adjacent Low Temperature Accumulator. (See Photo 58).

(c) The Pilot Receiver Tank and some of the ammonia piping and oil separator tanks were painted yellow as seen in photo 57. The EPA inspectors also observed the facility had painted natural gas lines in other parts of the facility yellow as well as seen in Photos 1 and 3.

(d) The Control Pressure Receiver was corroded and had compromised insulation as seen in Photo 58. Ice was present on parts of the insulated tank, and other portions of the insulated tank were green due to biological growth.

The Control Pressure Receiver was built in 1984 based on the date stamped on the U plate. There is no National Board number stamped on the U plate. Where the National Board number is usually stamped, "NA" is stamped as seen in Photo 82.

At the base of the Control Pressure Receiver towards the left hand side on the bottom of the tank is a short pipe with a hand valve and threaded plug at the end as seen in Photos 58 and 59. The valve and pipe were not supported, and the valve assembly did not have a spring-loaded closer valve for draining oil materials from the Control Pressure Receiver tank.

The Control Pressure Receiver isolation valve(s) (King Valve(s)) were not marked and the valve(s) were several feet off the ground, well beyond the reach of a first responder.

(e) Mr. Wallace asked whether the Pilot Receiver and/or the Control Pressure Receiver had ever been tested for tank integrity. The Stavis Seafoods representatives responded that they did not know.

(f) The Dump Tank has compromised insulation and rusty pipes as seen in Photo 84. Mr. Wallace observed that the U plate was unreadability.

(g) Rusted, unpainted, uninsulated and compromised insulation pipes:

Photo 71 shows some of the ammonia piping as painted yellow and some of the same piping not painted at all (black in color). None of the ammonia piping in Photo 71 is labeled.

Photo 76 shows a valve handle (tag CPR V-15) and piping that is rusted, and the support strap is also covered in rust.

Photo 86 shows ammonia piping with missing insulation and with a large buildup of ice with a valve tag sticking out of the ice.

(h) Photo 71 shows how the oil from the ammonia release from the Pilot Receiver sprayed up on to the ammonia piping, electrical conduit and ceiling.

(i) Lack of labeling on piping and other system components:

Photo 104 shows Compressor Number 5 ammonia piping with no labeling and no identification on the oil separator tank (yellow).

Photos 65 and 70 show no labeling on the ammonia piping.

Photo 62 shows two oil separator tanks (yellow) with no labels to identify them.

(j) Inadequate alarms: There were no audio/visual alarms present in the Maintenance/Ammonia Machinery Room area as part of an emergency notification system.

(k) Unsecured electrical wiring was taped to the sides of rusted ammonia piping on the High Stage (See Photo 113).

(l) There was one ammonia detector observed in Ammonia Machinery Room in the ceiling near the center of the room.

(m) The ventilation for the Ammonia Machinery Room was not operating properly: The emergency exhaust ventilation was on and operating during the inspection, yet the air intake louvers were not open as they should have been. (See Photos 58, 83 and 84).

(n) Lighting in the Ammonia Machinery Room was poor; for example if the double doors were not open it would have been very dark. (See Photo 50).

(o) The Ammonia Machinery Room had only one entrance/exit route down the wooden staircase to the first floor maintenance/storage area. This route did not lead directly to the outside or to a vestibule. The Ammonia Machinery Room, located on the second floor, had two sets of double doors leading directly to the exterior of the building, but there were no external stairs beyond the doors, meaning the doors led to empty space and therefore could not provide a safe exit from the Ammonia Machinery Room. (See Photos 11, 15, 51, 104 and 137).

(p) There was no door to close off the Ammonia Machinery Room from the first floor maintenance/storage area.

(q) The inside of the Maintenance/Ammonia Machinery Room Principal door lacked any panic-type hardware (Crash bar on door) (See Photos 8 & 9).

(r) There were no emergency shutdown controls easy accessible from the second floor Ammonia Machinery Room. The only emergency shutdown controls were located outside the building on the first floor.

(s) The floor drains in the Ammonia Machinery Room led directly to exterior storm drains that empty into Boston Harbor. Seen in Photo 52 is one of the floor drains into which oil from the ammonia release went down the drain. Mr. Wallace observed oil coating the cover of the rain depicted in Photo 52. The drain is just to the right of the open paper bag on the floor. The drains in the Ammonia Machinery Room were not protected to keep oil out of them.

In Photo 52 you see a plastic table on the left of the picture that had been covered by the oil from the Pilot Receiver pipe break.

Also Photos 52, 57 and 59 show the oil absorbent material, which was spread out by the Boston Fire Department that morning to cover the oil still on the floor to reduce the chances of slipping on the floor.

(t) The Hot Water Tank gets its heat from an ammonia heat exchanger tank. The Hot Water Tank had no Confined Entry Space warning label on it. (See Photos 68 &69).

(u) Mr. Wallace noted an oily liquid dripping onto his hard hat from ammonia pipe above the light next to the Hot water tank heat exchanger. (See Photo 69). Photo 108 shows where the oily liquid landed on the floor. The spot is close to the red cart on the floor. Photo 109 shows the oily liquid on the fluorescent light tube and the light's metal housing.

(v) Photo 116 shows the M&M Refrigeration panel Failure Log. The panel indicated that the current date and time was "March 24, 2016 at 10:10:45". The M&M Refrigeration panel displayed that the Emergency Stop was activated on March 23, 2016 at 16:58:10. We noted that there was a time discrepancy indicated on the panel and current time. We put a cell phone next to the M&M Refrigeration panel to display the current time which shows a 1 hour and 23 minutes difference.(See Photo 116).

(w) Photo 54 shows an air compressor /tank and lockout/tag out cabinet with oil from the release underneath and around them. The compressor came on while we were conducting our inspection even though the room's Emergency Stop had been activated. This indicates that not all the power to the machinery had been de-energized in the Ammonia Machinery Room.

(x) The High Temperature Accumulator and piping seen in Photos 99 and 101 show the piping was not labeled, and the sight glass and related piping were corroded and rusted.

(y) The engineering drawing, shown in Photos 87-92 and 122-124, was identified as the Piping and Instrumentation Diagram (P&ID). It was created by American Refrigeration Company and labeled Engine Room System P&ID, R1.1 dated 10/8/2013. This drawing was not signed and was not stamped in the seal area. This drawing was only for the evaporators and ice machines. It did not show any of the valves or refrigeration equipment in the Ammonia Machinery Room.

(z) The Stavis Seafoods facilty did not have a legible, permanent sign in the ammonia machinery rooms displaying the following information:

1. Name and address of the installer
2. The refrigerant number and the amount of refrigerant in the system
3. The lubricant identity and amount
4. The field test pressure(s) applied

(aa) Mr. Wallace did not observe any eyewash/safety showers in the Ammonia Machinery Room or outside the Ammonia Machinery Room on the second floor.

(bb) There was no secured gate with panic hardware to enable passage to Massport Haul Road from the alleyway (Photo 139).

(cc) Mr. Wallace observed holes in the floor and on the wall near the ceiling behind the Dump Tank

Roof

The roof of the Ammonia Machinery Room was inaccessible during the Inspection. Mr. Wallace observed the aluminum ladder was not set up to safely access the roof. The aluminum ladder was too close to the edge of the top landing in Ammonia Machinery Room and was in the way of getting on and off the steps. The EPA inspectors did not access the roof during this inspection. Also there was oil tracked onto the top landing which compromised the safety of using the ladder. The aluminum ladder is visible in Photos 120, 121. The roof is visible in Photo 3.

Exterior Area

The inspectors walked around the outside of the building. (See Photos 126 – 142).

V. OUT-BRIEF/CLOSING CONFERENCE

In general, the inspection identified and photographed issues of concern related to failure to maintain a safe work place, compromised mechanical integrity of integral infrastructure in the ammonia refrigeration system, improper storage of hazardous materials, lack of adherence to industry standards for safety, inadequate labeling of hazardous areas and improper petroleum storage.

The inspectors concluded the on-site inspection by summarizing the issues and offering some preliminary suggestions for improvements related to facility safety concerns and compliance. Mary Fleming, Stavis Seafoods, Chief Financial Officer (CFO) joined the group at this time to participate in the out-briefing/closing conference.

The following observations are areas of concern or requests for further information and were discussed by Mr. Wallace with respect to the General Duty Clause (GDC) under the Clean Air Act (CAA), Emergency Planning and Community Right to Know Act (EPCRA) Sections 302 – 312 and Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 103:

Starting in the vicinity of the Principal Access (Double) Doors leading into the Storage/Maintenance area on the first floor and the Ammonia Machinery Room on the second floor:

Principal Access Door

Needs proper warning sign under the visual alarm above the Principal Exterior Door.

Red light above the principal outside door should be checked to determine if there is both an Audio and Visual alarm.

Need proper signs above the Emergency Ventilation and Emergency Machinery Shutdown switch's/buttons.

Need proper Signs on the Principal Access Doors, including the following signage:

1. Facility lacked any Refrigeration Machinery Room and Restricted Access sign.

2. Facility had inadequate Caution Ammonia sign.

3. Facility lacked any Caution Eye and Ear Protection Required sign in this area.

4. Facility had inadequate NFPA 704 Ammonia Fire Diamond 3-3-0, warning for indoor ammonia refrigeration equipment sign.

Needed tight fitting doors.

Needed to update how to access the emergency switches for shutting down the ammonia equipment and to activate the emergency ventilation system, as only one person had the key to access the control box.

Storage/Maintenance area on first floor

Glycol system not marked.

Should not have oils, chemicals, combustible or flammable materials under or near the wooden stairs.

Flammable Storage cabinet needs to be grounded.

Cutting Torch cart needs to be secured.

Charging station under wooden stairs has frayed wires coming out of the unit.

None of the oils, chemicals or products stored in this area had any secondary containment.

Need to segregate materials for incompatibility.

Need to separate materials into Waste, Hazardous Waste and Universal Waste.

Need plumbed Eye Wash/Safety Shower Stations. The Facility had an inadequate eye wash station, which appeared to be empty of water.

Ammonia Machinery Room on Second Floor

Need to do Non-Destructive/Integrity Testing on the entire ammonia system.

Insulation on pipes, Control Pressure receiver and dump tank all show signs of being breached, including cracked insulation, rust, ice, and biological growth on equipment. Insulation should be removed for pipe and tank inspection and then replaced.

All ammonia piping and tanks need to be painted and properly labeled.

Need two ammonia sensors - one for 25 ppm and one for 200 ppm detection level.

Need to look at isolating the second floor.

The two sets of second floor doors need gates to prevent a person from falling out of the opening.

Need doors labeled properly.

Emergency Isolation Valves such as the King Valves need to be uniquely identified.

Need to have accessible Emergency Isolation Valves such as the King Valves.

Need permanent sign securely attached and easily accessible on the ammonia refrigeration system displaying: name and address of the installer; refrigerant number and amount of refrigerant in the system; lubricant identity and amount; and field test pressure(s) applied.

Piping and Instrumentation Diagram (P&ID) diagram should be moved from the back of the Door and placed either on the wall as you enter or on the wall near the top of the steps.

All ammonia system vessels need to be labeled properly.

Need to protect pipes from bumps and provide proper support to pipes and valves.

Need to have a permanent structure to provide access to the ammonia equipment on the roof, rather than an unsafe ladder.

Need additional wind socks; and the wind socks should be mounted 3 meters above roof line and visible from different points of access to the facility.

High Stage Compressor 1 had electric wire leads that were not properly secured.

Need a plumbed Eye Wash/Safety Shower Station on this floor.

Need to check why the louvers were closed when they should be open with the emergency ventilation operating.

Company supplied a diagram showing the location of floor drains in the building, and Mr. Boyens, explained to us that the floor drains are connected to the storm drains that discharge to Boston Harbor.

We told the company office they should notify the National Response Center ("NRC") at 800-424-8802 because of the oil and ammonia released during the incident.

Need to identify who will be the designated operator of the Ammonia system now.

Need to provide a copy of the original ammonia system calculations done by Stavis Seafoods, Inc.'s contractor, American Refrigeration Company, and new ammonia system calculations for equipment currently at the facility. One of the reasons for new ammonia system calculation is that the inspectors were informed that a new larger condenser was installed on the roof within the last two years.

Need to provide Pressure Relief Valves installation and replacement records.

Need to provide ventilation calculations for all phase of operations.

Need to provide copy of the contract with American Refrigeration Company, Inc.

Need to provide copy of the Emergency Plan(s) for all regulations.

Emergency Planning and Community Right-to-Know – EPCRA

Supply copy of Tier 2 for 2015, along with proof of submission to the Boston Fire department, Boston Local Emergency Planning Committee (LEPC) and State Emergency Response Commission (SERC).

Need inventory of all chemicals, materials and products and their Safety Data Sheets (SDS).

Two materials of special note are the amount of Lead Acid Batteries in the electric forklifts and trucks and the amount of Glycol solution and the type of Glycol in the system.

OSHA

This a continuing process in which there will be follow up requests for information and interviews.

Massachusetts Department Public Safety - Boilers

Continuing to monitor the situation.

Boston Fire Department

http://www.cityofboston.gov/fire/forms/

Need to file an Annual Permit Application.

Need to file Hazardous Material Process or Processing – Form FP 300.

Need to provide a copy of Sprinkler and Fire alarm report.

Boston Police Department

Told the group that this ammonia release event was ruled an Industrial Accident.

VI. FACILITY'S EPCRA COMPLIANCE STATUS

The Boston Fire Department had not received the Tier 2 for 2015 which was due March 1, 2016. Nor had the Boston Local Emergency Planning Committee (LEPC) received the Tier 2.

Mr. Wallace asked Stavis Seafood representatives to supply a copy of Tier 2 for 2015, along with proof of submission to the Boston Fire department, Boston Local Emergency Planning Committee (LEPC) and State Emergency Response Commission (SERC).

Mr. Wallace asked Stavis Seafood representatives to supply an inventory of all chemicals, materials and products and their Safety Data Sheets (SDS).

Stavis Seafoods representatives, verbally stated the total amount of ammonia on site was 5,400 pounds. That amount of ammonia in the system was based on calculations done by American Refrigeration Company on September, 2009 on behalf of Stavis Seafoods.

During the inspection in the Storage/Maintenance area on first floor the inspectors observed an electric forklift as seen in Photo 27, which had a Lead Acid Battery, and we later observed a Stavis Seafood truck in the parking lot as seen in Photo 131, which would also have a Lead Acid Battery.

Stavis Seafood representatives told us they had about 10 electric forklifts at this facility and that the Tier 2 did not list Lead Acid Batteries and/or Sulfuric Acid and/or Lead on the Tier 2 form.

The amount of Glycol solution and the type of Glycol in the system was unknown to Stavis Seafood representatives as seen in Photo 32.

CAS #	Chemical	Approx. Max. Wt. on Site (Lbs.)	EHS TPQ (Lbs.)	Reporting Threshold (Lbs.)	Approx. Ratio (Actual/TPQ)
7664-41-7	Ammonia, anhydrous	5,400	500	500	10.8
	Lead Acid Batteries – Sulfuric Acid Lead		1,000	500 10,000	
	Glycol Type			10,000	

VII. POST-INSPECTION REVIEW OF DOCUMENTS

On March 24, 2016, Mr. Gary Hardin, Stavis Seafoods's Regulatory Affairs Manager called the National Response Center (NRC) and reported an ammonia release of 5380 pounds and one fatality of an employee. The Incident Report number is 1143605. Ammonia was the only material reported to the National Response Center in this report.

In the electronic documents that were collected by Kenneth Shedden, OSHA, on a USB Flash Drive from Stavis Seafoods Inc. and shared with the EPA was a document titled "EMERGENCY PREPARDENESS PROGRAM" which was not dated or signed. The document is 9 pages, single sided. In Section I the following company officials are listed in the plan: RICHARD STAVIS, CHIEF EXECUTIVE OFFICER; BRETT HEIDTKE, DIRECTOR OF OPERATIONS; STUART ALTMAN, EXECUTIVE VICE PRESIDENT; BRIAN CARON, FACILITY MANAGER; MARK COHEN, HUMAN RESOURCES; RICHARD BOOKMAN, CONTROLLER; ART ANTCZAK, OPERATIONS MANAGER; GARY HARDIN, REGULATORY AFFAIRS MANAGER.

Section II of the Emergency Preparedness Program "Public Emergency Telephone Numbers" only listed: 911, a "Medical Clinic. Phone Number: (617) 568-6500" (the telephone number goes to Concentra Health Services, 1 Harborside Drive, Boston, MA 02128), Poison Center, Boston Water and Sewer Department and Eversource Electric. The document did not list the National Response Center (NRC) 800-424-8802 or the Massachusetts Department Environmental Protection (DEP) Emergency Response at: 1-888-304-1133.

In Section IV, the following three enclosures were missing: A EVACUATION PLAN, B BUILDING FLOOR PLAN, C FIRE EXTINGUISHER FLOOR PLAN.

Section V "Emergency Planning" listed only the following directions for responding to toxic chemical release:

"2. TOXIC CHEMICAL RELEASE

IN THE EVENT OF A TOXIC CHEMICAL RELEASE, MOST PARTICULARLY **AMMONIA** FROM THE REFRIGERATION SYSTEM, THE IMMEDIATE AREA SHOULD BE CLEARED AND MANAGEMENT NOTIFIED TO DECIDE ACTION.

1. INITIATE EMERGENCY EVACUATION

2. CONTACT LOCAL EMERGENCY PLANNING COMMISSION AND STATE DEPARTMENT OF ENVIRONMENTAL PROTECTION.

3. CONTACT AMERICAN REFRIGERATION"

The document dose not list the emergency number for AMERICAN REFRIGERATION.

In the electronic documents that were collected by Kenneth Shedden, OSHA, on a USB Flash Drive from Stavis Seafoods Inc. and shared with the EPA , was a separate electronic document titled "APPENDIX A EMERGENCY RESPONSE PLAN FOR AMMONIA RELEASE", This document was not dated or signed on page 11 under 4.12 APPROVALS. The document is 11 pages.

The document states "this emergency response plan has been developed to cover only uncontrolled releases of anhydrous ammonia refrigerant. Our HAZMAT team is not authorized, trained, or equipped to handle any other hazmat situations." At no time during the inspection did Stavis Seafoods management present any other documents or training records to show they had a HazMat Team.

Stavis Seafoods lists only one Extremely Hazardous Substance (EHS) material under EPCRA in this plan under "Section 1.1.2 Site and Facility Description: b. Hazards: Anhydrous Ammonia". Another EHS that should have been listed is Sulfuric Acid from Lead Acid Batteries.

"Section 1.1.3 Interaction with SERC and LEPC plans:" states "b. All chemicals covered in the plant hazard communication (right-to-know) program have been reported to the Massachusetts Department of Environmental Resources to fulfill SARA Title III requirements." The above statement is incorrect because the information and data under EPCRA (SARA Title III) information has been sent to the Massachusetts Emergency Management Agency (MEMA) for over 10 years.

Under 1.1.4 Coordination with outside Parties "(2) Any release of anhydrous ammonia or other hazardous chemical into the outside air or any sewer, waterway, or groundwater must be reported immediately to the EPA: U.S. Environmental Protection Agency Hazardous Waste Branch, 5 Post Office Square - Suite 100 Boston, MA 02109-3912 1-888-372-7341 b. State Agencies: (1) Any release of anhydrous ammonia or other hazardous chemical into the outside air or any sewer, waterway, or groundwater must be reported immediately to the Massachusetts Department of Environmental Protection.1 Winter Street Boston Ma 02108 617-292-5500"

The above listed telephone are not the 24 hour Emergency Numbers to report a release.

This document states an audio alarm will sound in ammonia emergency: "1.3.2 Emergency Response: Any uncontrolled release of anhydrous ammonia gas or liquid will activate the plant's gas alarm and trigger a HAZMAT emergency response. Upon sounding the gas alarm, all plant employees will evacuate following the emergency action plan found in section 3 of this plan.".

The EPA inspectors were unable to identify any audio alarms that would sound during ammonia emergency.

A third electronic document reviewed was the "AMMONIA REFRIGERATION MANAGEMENT PROGRAM, MANAGEMENT SYSTEM". It was dated 7/22/2013 but was not signed. This document lists who are the responsible parties for the management of the ammonia refrigeration system:

Ammonia Refrigeration Management (ARM) Program Responsibilities

Section	Responsible Person
2. Overall Program Manager	Brian Caron
3. Refrigeration System Documentation	American Refrigeration Company
4. Operating Procedures	Brian Caron / Gary Hardin
5. Preventive Maintenance Program	Brian Caron
6. Contractor Program	American Refrigeration Company
7. Emergency Response Program	American Refrigeration Company / LERC
8. Incident Investigations Procedures	Brian Caron / Gary Hardin
9. Training Program	Gary Hardin / Brian Caron
10. Hazard Review Procedures	Brian Caron / Gary Hardin
11. Refrigeration System Change Procedures	Brian Caron

The document lists Stavis Seafood's ammonia refrigeration system operators:

"The following personnel are responsible for the Stavis Seafoods Ammonia Refrigeration Management Program:

Brian Caron (Facility Manager / System Operator)

American Refrigeration Company (System Operator)

Gary Hardin (Regulatory Affairs Manager)"

In the AMMONIA REFRIGERATION MANAGEMENT PROGRAM "REFRIGERATION SYSTEM DOCUMENTATION" is a one page pdf labeled "American Refrigeration Preventative Maintenance Agreement for Stavis Seafoods 2014 page 4 of 8". The other 7 pages were not in this pdf or anywhere in the document.

Instructions with details and steps for shutting down the ammonia system in an emergency were not found in any of the documents that were collected.

VIII. FACILITY COMPLIANCE STATUS

Table 1 presents a summary of the areas of concern identified by the EPA inspection team with respect to the CAA GDC during and after the on-site compliance inspection at the Stavis Seafoods, Inc. facility.

Table 1. Stavis Seafoods CAA § 112(r)/EPCRA Compliance Inspection Areas of Concern

Area of Concern	Applicable Standards and Guidance
Failure to have an oil drain system on each of the high pressure receiver vessels with an appropriate quick-closing valve.	ANSI/IIAR 2-2008 (Add. B), Section 14.2.3 ANSI/IIAR 2-2014, Section 5.9.3 Oil Removal. IIAR Bulletin 110, Section 6.8 (1993) IIAR's Ammonia Refrigeration Manual (2005), Appendix A, items 5.14 and 5.15 at A10-25
Failure to adequately safeguard piping, valves, and other system components from accidental damage or rupture by external sources. Also, failure to support piping to prevent damage from vibration, stress, corrosion, and physical impact. This applies to ammonia and oil drain piping at the Facility.	ANSI/ASHRAE 15-2013, Section 11.1 ANSI/IIAR 2-2014, Sections 5.17.1 and 13.4.2
The only door entering the AMR lacked adequate labeling to: warn of the hazards of entering a room with ammonia-containing machinery; restrict access to authorized personnel; provide appropriate information about alarms; and post emergency procedures.	ANSI/IIAR 2-2008 (Add.B), Sections 13.1.2.4, 13.1.10, and Appendix L ANSI/ASHRAE-15-2013, Sections 8.11.8, 11.2.4, and 11.7 ANSI/IIAR 2-2014, Sections 6.3.4, 6.15.2, and 6.15.3, and Appendix J

Table 1. Stavis Seafoods CAA § 112(r)/EPCRA Compliance Inspection Areas of Concern

Area of Concern	Applicable Standards and Guidance
The facility did not have a permanent sign in any location on the ammonia refrigeration system displaying the following information: a) Name and address of the installer b) The refrigerant number and the amount of refrigerant in the system c) The lubricant identity and amount d) The field test pressure(s) applied	NFPA 1-2012, Section 53.2.4.1 (requires most of the listed info.) IIAR Bulletin 109, Section 4.10.4 ANSI/ASHRAE 15-2013, Section 11.2.1 ANSI/IIAR 2-2014 IIAR's Ammonia Refrigeration Manual (2005), Appendix A, item 11.1 at A10-40
There were no emergency shutdown instructions in any of the documents that were collected from Stavis Seafoods	ANSI/IIAR 2-2014, Section 5.15 IIAR Bulletin 109, Section 4.10.5 IIAR's Ammonia Refrigeration Manual (2005), Sections 7.3 and 4.2
The doors into the AMR, where the high pressure receivers (HPR) were located, were not tight-fitting and self-closing.	ANSI/ASHRAE 15-2013, Sections 8.11.2 and 8.12(b) ANSI/IIAR 2-2008 (Add. B), Sections 13.1.10.1, 13.1.10.2 ANSI/IIAR 2-2014, Section 6.10.2 Door Features. IIAR's Ammonia Refrigeration Manual (2005), Appendix A, item 11.14 at A10-42
The areas in the facility containing significant quantities of ammonia, including the AMR, contained an ammonia vapor detector but did not have an audio/visual alarm system.	NFPA 1-2012, Section 53.2.3.1 ANSI/ASHRAE-15-2013, Sections 8.11.2.1, 8.12(h) ANSI/IIAR 2-2008 (Add. B.), Section 13.2 ANSI/IIAR 2-2014, Section 6.13.1 IIAR's Ammonia Refrigeration Manual (2005), Appendix A, item 9.2 at A10-36

Table 1. Stavis Seafoods CAA § 112(r)/EPCRA Compliance Inspection Areas of Concern

Area of Concern	Applicable Standards and Guidance
The AMR walls contained holes and gaps for piping and conduit that were not sealed from other spaces in the building.	ANSI/ASHRAE-15 (2013), Sections 8.11.2, 8.11.7, and 8.12(f) ANSI/IIAR 2-2008 (Add. B), Sections 13.1.1.3, 13.1.5.2 ANSI/IIAR 2-2014, Section 6.2.5
The Emergency Shutdown Valves (King Valves) were not identified with a prominent sign.	IIAR Bulletin 109, Section 4.10.3 and general safety checklist items (d) and (e). ANSI/ASHRAE 15-2013, Section 11.2.2.a. NFPA 1-2012, Section 53.2.4.2(1) ANSI/IIAR 2-201, Section 5.14.3 Emergency Shutdown Valve Identification and Tagging.
The Emergency Shutdown Valve (King Valve) was not accessible on the Pressure Control Receiver	ANSI/IIAR 2-2014, Section 6.3.3.2 IIAR Bulletin 109, 4.10.3 ANSI/ASHRAE 15-2013, Section 11.2.2
The pressure relief valves observed on the ammonia refrigeration system did not contain tags identifying the date of installation or date of last inspection, and the Facility was not able to produce any other information about valve testing.	IIAR Bulletin 109, Section 4.9.7 IIAR Bulleting 110, Section 6.6.3
Few of the refrigeration pipes and few of the valves in the refrigeration process were labeled to identify contents, pressure, physical state, or direction. Nor were the accumulators clearly labeled.	ANSI/ASHRAE-15 (2013), Section 11.2.2 ANSI/IIAR 2-2008(Add. B), Section 10.6 IIAR Bulletin 109, Section 4.7.6 IIAR Bulletin 114, Sections 4.1 (piping) and 4.2 (refrigeration components) ANSI/IIAR 2-2014, section 5.14.5 (Pipe Marking)

Table 1. Stavis Seafoods CAA § 112(r)/EPCRA Compliance Inspection Areas of Concern

Area of Concern	Applicable Standards and Guidance
There was one remote control present at the facility for operating the equipment in the AMR for the purpose of shutting down the equipment and for starting a ventilation fan in an emergency, but the switches lacked clearly marked signage about their function. Also, due to a missing key (which Mr. Caron had), the switches were not easily accessible to emergency responders. Also, given that the ammonia machinery room was upstairs without a separate entry door, the emergency control switches would have been difficult to access in an emergency by people running from the machinery room. Also, although the emergency ventilation was turned on March 24, 2016, on the date of EPA's first inspection, the air intake louvers in the machinery room did not open, which means the remote controls may not have been properly functioning. Moreover the emergency switch to turn off the compressors was activated during that inspection but may not have been working properly, as the compressors came on during the inspection. Finally, the emergency switch for shutting down the equipment did not appear to shut off power to all the machines in the Ammonia Machinery Room. An air compressor came on during the March 24, 2016 inspection although the emergency stop switch was activated.	NFPA 1-2012, Sections 53.2.3.4.5 (switch for compressors, pumps, and automatic valves), 53.2.4.2 (signs designating remote controls), and 53.2.3.3.1 (switch for ventilation), 53.2.3.3.6 (accessibility of ventilation keys) ANSI/ASHRAE-15 (2013), Section 8.12(i) ANSI/IIAR 2-2008 (Add. B), Sections 13.1.13.2, 13.3.11 ANSI/IIAR 2-2014, Section 6.12, 6.12.1 and 6.12.2 IMC 2009 Sections 1106.5.1 (off-only switch for equipment) and 1106.5.2 (on-only switch for ventilation)

Table 1. Stavis Seafoods CAA § 112(r)/EPCRA Compliance Inspection Areas of Concern

Area of Concern	Applicable Standards and Guidance
Failure to provide a clear and unobstructed approach and space to refrigeration machinery for inspection, service, and emergency shutdown with adequate clearances for maintenance of equipment. The ammonia machinery room also lacked safe access to the equipment on the roof, as the roof could only be accessed by an unsecured ladder placed precariously near the wooden steps leading downstairs. Also, the ammonia machinery room was very dark, making it difficult to see, inspect, and move around equipment. Finally, access to and egress from the ammonia machinery room itself was unsafe. The only access and egress was up wooden, combustible stairs, and the upstairs door leading to open air had no steps or protection from falling to the ground.	ANSI/IIAR 2-2008 (Add. B), Section 13.1.2.2 ANSI/ASHRAE 15-2013, Sections 8.3, 9.12.1 IMC 2009, Section 306.1 (where applicable) ANSI/IIAR 2-2014, Sections 6.11 and 6.3.1
The emergency exhaust discharge points are less than 20 feet from property line.	NFPA 1-2012, Section 53.2.3.3.12 IMC 2009, Sections 1105.6.1 (discharge location from ventilation exhaust) ANSI/IIAR 2-2014, Section 6.14.3.4
Lack of proper eyewash/safety showers inside or immediately outside the Maintenance/Ammonia Machinery Room. There was an eyewash station (without a safety shower) at the bottom of the wooden stairs, but it would not have been easily accessible by a worker located upstairs in the machinery room. When Mr. Wallace tapped the gravity-feed eyewash station during the May 24, 2016 inspection, it sounded hollow (i.e., without much water).	ANSI/IIAR 2-2014, Section 6.7 Eyewash/Safety Shower, specifically Sections 6.7.1, 6.7.2 and 6.7.3 ANSI/IIAR 2-2008 (Add. B), Section 13.1.6 IIAR Bulletin 109, Section 4.10.10
The floor drains in the Maintenance/Ammonia Machinery Room did not have means to prevent the entry of spilled materials such as oil. The drains were connected with the storm drain system, which leads to Boston Harbor.	ANSI/IIAR 2-2014 6.9 Drains 6.9.2

Table 1. Stavis Seafoods CAA § 112(r)/EPCRA Compliance Inspection Areas of Concern

Area of Concern	Applicable Standards and Guidance
The AMR ventilation fan mounted on the roof was functional, but the ventilation inlet louvers mounted in the sidewall were not working, and remained in the closed position when the ventilation was turned on.	ANSI/ASHRAE-15 (2013), Sections 8.11.3, 8.11.4, and 8.11.5 ANSI/IIAR 2-2008 (Add. B), Section 13.3 ANSI/IIAR 2-2014, Section 6.14.5 (Inlet Air)
The windsock observed on the building could not be seen from multiple locations around the facility.	29 CFR 1910.119 Appendix C ANSI/IIAR 2-2014, Section 5.14.6 *Wind Indicator.
Excessive corrosion was noted on refrigeration piping in the AMR. Also, vapor barriers on piping were failing, risking further corrosion.	IIAR Bulletin 109, Sections 4.7.4, 4.7.5 IIAR Bulletin 110, Section 6.7 NFPA 1-2012, Section 53.3.1.1 IMC 2009, Section 1101.7 ANSI/IIAR 2-2014 5.10.1, 6.6.1 and 13.4.2.
Nameplate on Dump Tank was not readable.	ANSI/IIAR 2-2014, Section 5.14.4 Nameplates, specifically 5.14.4.1 and 5.14.4.2
There was excessive ice buildup on refrigeration piping, the controlled pressure receiver, and valves in AMR.	ANSI/ASHRAE 15-2013, Section 11.6 IIAR Bulletin 109, Sections 4.7.4, 4.7.5, 4.10.7 and general safety checklist item (s) IIAR Bulletin 110, Section 6.7
Fire Hazards: The AMR contained exposed wiring and wiring connections in electrically classified locations. There were also combustible materials in the AMR, given the lack of a door between the refrigeration machinery, the wooden stairs, and the combustible/flammable items stored on the ground floor.	IIAR Bulletin 109, general safety checklist item (x) ANSI/IIAR 2-2008(Add. B), Sections 13.1.7 and 13.1.3.1 NFPA 1-2012, Sections 53.3.1.3.1, 11.1 ANSI/IIAR 2-2014, Section 6.4

Table 1. Stavis Seafoods CAA § 112(r)/EPCRA Compliance Inspection Areas of Concern

Area of Concern	Applicable Standards and Guidance
Most of the natural gas pipes in the facility did not have labels to identify contents and direction of flow, although some were located right next to ammonia pipes containing flammable material. Also, some of the natural gas pipes were painted the same yellow color as the ammonia pipes, which could confuse employees and emergency responders.	ASME 13.1(2007)
There was inadequate documentation about the technology and equipment in the process at the facility itself. For example, the process and instrumentation diagram posted in the Ammonia Machinery Room did not include some of the key equipment present in that room. Combined with the lack of National Board numbers on pressure vessel name plates (or other information about those pressure vessels), it was difficult to understand the design and maintenance needs of the process.	IIAR Bulletin 110, Section 4 (records) IIAR's Ammonia Refrigeration Manual, Section 3
The facility has more than 500 lbs. of anhydrous ammonia, which is an Extremely Hazardous Substance (EHS) and has not submitted a 2015 Tier 2 Form to the Boston Fire Department or the Boston Local Emergency Planning Committee (LEPC).	40 CFR 370.10

IX. ENFORCEMENT HISTORY

The facility has no reported violations in ECHO.

X. ENVIRONMENTAL JUSTICE

The national EJSCREEN mapping tool indicates that the Facility is located in an Environmental Justice area.

U.S. ENVIRONMENTAL PROTECTION AGENCY

Region 1

EPCRA and CAA 112(r) Inspection Report

Date: July 1, 2016

From: Leonard Wallace IV, Enforcement Officer

Through: Mary Jane O'Donnell, Manager, RCRA, EPCRA, and Federal Programs Unit

To: File

Subject: Chemical Accident Investigation and Inspection, under Clean Air Act (CAA) Section 112(r) and Emergency Planning and Community Right-To-Know Act (EPCRA) Sections 302-312, of Stavis Seafoods, Boston, MA

I. GENERAL INFORMATION

Facility Name: Stavis Seafoods, Incorporated (Inc.)

DUNS Number: 831817353

Address: 7 Channel Street, Boston, MA 02210

Inspector Names:

Leonard B. Wallace IV, U.S. Environmental Protection Agency (EPA), Region 1
David F. Oberhauser, US EPA/SEE/NOWCC
James R. Valentine, US EPA/SEE/NOWCC
Andrew Loll, ERG
Larry Aleksandrich, Ammonia Refrigeration Consultant

Inspection Date: April 6, 2016

Type of Inspection: Follow-up CAA 112(r)/EPCRA inspection

Purpose of Inspection: This inspection was conducted as a follow-up to the initial EPA 112(r)/EPCRA inspection conducted on March 24, 2016. The March 24 inspection was conducted in response to a catastrophic release of anhydrous ammonia on March 23, 2016 resulting in a fatality at the facility. During the March inspection, the EPA inspection team observed several CAA Section 112(r) areas of concern related to the ammonia refrigeration system design and operation at the Stavis facility. In addition, the facility was unable to determine the ammonia charge quantity in their system. The purpose of this inspection was to reassess the current status of the ammonia refrigeration system with an industry-recognized ammonia refrigeration expert, Larry Aleksandrich, to determine corrective actions required to make the system safe for operation, and to determine the ammonia charge quantity. Representatives from the EPA, the Occupational Health & Safety Agency (OSHA), and the Boston Fire Department (BFD) participated in the joint agency inspection on April 6. This

report identifies observations and findings made by the EPA inspection team with respect to compliance with the CAA Section 112(r) and EPCRA requirements.

Current Property Owner: Economic Development and Industrial Corporation of Boston

Current Business Owner and Operator: Stavis Seafoods, Inc. and Stavis Seafoods Limited Partnership

Primary NAICS codes: 424460, Fish and Seafood Merchant Wholesalers

Number of full-time employees: Approximately 120 FTEs

Estimated Annual Sales: $203 million (Hoovers, March 24, 2016 report)

Relationship to other firms, parent corporation, subsidiaries, and location of off-site facilities: Stavis Seafoods, Incorporated is a privately held company located in Boston, Massachusetts. The Stavis administrative offices are located at 212 Northern Avenue, Suite 305, Boston, MA, 02210.

Parent Corporation: Stavis Seafoods, Inc.

II. GENERAL FACILITY DESCRIPTION

The Stavis facility is located in Boston, MA and processes and distributes fresh and frozen seafood. The company has approximately 120 full time employees and is a nonunion shop. The facility uses anhydrous ammonia in its refrigeration system for temperature control in the cooler and freezer rooms. The facility contains a refrigeration system in the Ammonia Machinery Room, two cooler rooms (Cooler Room A and Cooler Room B), a cutting/processing room in one corner of Cooler Room A, a Freezer Room, loading docks, forklift battery charging room, maintenance shop, chemical storage areas, and administrative offices. The facility contains cyclone fencing around three sides including along Massport Haul Road, but is not enclosed or gated along Channel Street.

According to an ammonia inventory list developed in 2009 by American Refrigeration Company, Incorporated (ARC), the amount of ammonia stored on site is 5,460 pounds. After the March 23 release Tanner Industries, Incorporated pumped out the system down to 40 psig and provided a Delivery Receipt showing 3,231 pounds of anhydrous ammonia were removed from the system on April 1, 2016. The EPA has requested additional verification documentation of the total system ammonia inventory.

III. IN-BRIEF/OPENING CONFERENCE

The EPA inspection team, including Leonard Wallace, IV, David Oberhauser, James Valentine, Andrew Loll, Eastern Research Group, Inc. (ERG) contract inspector, and Larry Aleksandrich, Aleksandrich Compliance and Engineering Services, LLC contract inspector, entered the facility at approximately 8:45 am. The inspection team presented identification to Mary Fleming, Stavis Owner and CFO, and other Stavis representatives during the opening conference in the conference room in the administrative office area. Inspector Wallace conducted the opening meeting and explained the reason and scope of the inspection. OSHA and BFD representatives also explained the scope of their respective inspections.

Inspector Wallace presented the EPCRA Notice of Inspection to Ms. Fleming, who signed as the Recipient of the Notice. Ms. Fleming did not attempt to deny facility entry to the inspectors, nor did she invoke any claims of Confidential Business Information (CBI) for purposes of the inspection.

Facility Representatives:

Name	**Title/Company**	**Phone Number**	**E-mail**
Arthur Antczak	Operations Manager/Stavis Seafoods	617-592-5135	aantczak@stavis.com
Salvatore Armata	Refrigeration Technician/ American Refrigeration Company	781-953-8962	sarmata@americanrefrigeration.net
Roumauld Boynes	Sanitation Supervisor/Stavis Seafoods		
Joseph Dimeco	American Refrigeration Company	781-534-8893	jdimecojr@americanrefrigeration.net
Mary Fleming	CFO/Stavis Seafoods	617-482-6349	mfleming@stavis.com
Gary Hardin	Regulatory Affairs Manager/ Stavis Seafoods	617-590-7668	ghardin@stavis,com
James McPartlin	Assistant Operations Manager/Stavis Seafoods	617-482-6349	jmcpartlin@stavis.com
Jeremy A. Okwuosa	Quality Assurance Director/Stavis Seafoods	857-288-9721	jokwuosa@stavis.com
Carlos Rita	Service Manager/American Refrigeration Company	978-474-4000	crita@americanrefrigeration.net
Michael Sirois	President/ American Refrigeration Company	978-474-4000	msirois@americanrefrigeration.net
Scott Sweet	Principal Advisor/HCG Associates	508-958-0700	ssweet.hcg@comcast.net

Inspector Wallace shared the following guidance documents with facility representatives:

1. EPCRA Fact Sheet (EPA 550-F-12-002, September 2012)
2. EPCRA 302/303 - Substances and Facilities Covered Forms and Notification letter
3. 2012 Tier II Submit Fact Sheet and MA Tier II Information
4. List of Lists (EPA 550-B-15-001, March 215)
5. Small Business Resource Information Sheet (EPA 300-F-11-006, June 2011)
6. *National Response Center Oil and Chemical Spill Reporting* flyer
7. *Chemicals in Your Community* brochure (EPA 550-K-99-001, December 1999)

During the inspection, Inspector Wallace requested and received copies of the following documentation:

1. Sign in sheet
2. Tanner ammonia pump-out delivery receipt dated 04/01/2016, No. N004070

3. American Refrigeration Company (ARC) 2009 ammonia charge/inventory documentation dated 09/07/2009 original & revised
4. M&M control system ammonia detection summary report from 3/23/2016 to 3/25/2016
5. Hansen Gas Sensors and Monitors, Bulletin A100, FEB 2006
6. ARC, Invoice Number W24082 Feb 28/13 Replaced relief valves
7. MSDS Ethylene Glycol, Reviewed 08/22/2011, Johnson Matthew Company

Inspector Wallace stated that after they did a preliminary review of the requested documents, inspectors expected to do a walk-through inspection of the refrigeration process and all facility areas where the inspection team would be taking photographs of items and areas of interest. A copy of all photographs taken would be sent to the facility representative after the inspection.

IV. PHYSICAL INSPECTION

General Inspection

The EPA inspection team conducted a walk around of the following areas at the Stavis facility:

1. Refrigeration system in the Ammonia Machinery Room and maintenance room
2. Roof
3. Cooler/freezer rooms and loading dock
4. Building perimeter

Mr. Oberhauser and Mr. Wallace took a total of 353 digital photographs (photos) of selected equipment and locations during the inspection to provide reference documentation of conditions observed during the inspection. A photo documentation log of these photos is attached to this report, and the photos will be referenced throughout the document. The inspectors did not collect any samples during the inspection.

Maintenance/Storage and Ammonia Refrigeration Ammonia Machinery Room

The inspectors conducted a walk around of the Maintenance and Ammonia Machinery Room area located on the southwest end of the facility and separated from the rest of the facility by cinderblock walls. The maintenance room, which also includes the chemical storage area, is located on the ground floor of the building and the Ammonia Machinery Room is located on the second floor of the building. The Maintenance Room contains floor drains and a barricaded access way that leads into an area beneath the ground floor that facility representatives claimed was a tidal sump. Presumably this sump drains to the Boston Harbor. Mr. Roumauld Boyens, Stavis Seafoods, stated that the floor drains inside and outside (see Building Perimeter section) the building also drain to Boston Harbor.

The Ammonia Machinery Room is accessed via a permanent wooden stairway. The only ground-floor entrance into the building, and the primary entrance to the Ammonia Machinery Room area, is through a set of double doors on the south end located in an alleyway between the administrative offices and the property line. The second floor of the building (Ammonia Machinery Room) also contains two sets of double doors on the south end of the building above the primary entrance and on the west side approximately 17 feet above ground level.

The south end doors in the Ammonia Machinery Room contain two sets of chains across the opening, but otherwise do not lead to stairs or any other means to safely exit from the room. The west end doors do not lead to stairs or any other means to safely exit from the room and do not have chains or any other barricades to prohibit someone from moving through the opening.

The Ammonia Machinery Room is split into two sections with the original Ammonia Machinery Room on the south end and an expansion room on the north end. The expansion room is elevated about four feet above the elevation of the original room and accessed by a short permanent ladder. The original Ammonia Machinery Room, built in 1984, contains four reciprocating compressors with oil separators, pilot receiver, control pressure receiver, transfer (dump) tank, low and high temperature accumulators, shell and tube heat exchangers, M&M process control panel, electrical switchgear, and associated refrigeration piping. The expansion room was installed in 2005 and includes one reciprocating compressor with an oil separator, a large accumulator vessel, an electrical switchgear room, and associated refrigeration piping.

Compared with the condition of the rooms observed during the March 24 inspection, the facility had removed a significant amount of material and clutter from both floors of the building including underneath the stairway. In addition, the facility had contracted with Clean Harbors to clean up all of the residual oil on the floor, equipment, and piping in the Ammonia Machinery Room. The inspectors observed some oil still on the overhead piping.

The power to the Ammonia Machinery Room areas was shut off prior to this inspection.

Based on the walk around the Maintenance Room and Ammonia Machinery Room areas, the inspection team observed the following areas of concern:

- The floor drains and tidal sump in the Maintenance Room appear to drain directly to the Boston Harbor with no engineering or administrative controls to prevent oils or other hazardous substances from reaching navigable waters (see Photographs 1 through 5).

- The glycol system header, located in the Maintenance Room area, is part of the ammonia system and the piping and equipment were unlabeled. The glycol piping regulates the floor temperature in the refrigerated rooms and also travels through the Ammonia Machinery Room on the second floor (see Photographs 21 through 24). None of the facility representatives knew what type of glycol (i.e., ethylene or propylene) was used or the amount of glycol solution that was in the system.

- A red visual alarm was located above the primary entrance to the Ammonia Machinery Room with a small label stating “Refrigeration Emergency” (see Photograph 1). The label was barely legible from the ground and did not adequately identify the purpose of the alarm or what “Refrigeration Emergency” means. For example, the alarm may indicate the presence of ammonia or may indicate some other process upset condition with the refrigeration system not related to an ammonia release. There was no audio alarm near the door. Additionally, there were no audio or visual alarms near the second-floor doors should someone attempt to enter the room

from the outside (e.g., ladder or fire truck). Also, there were no audio/visual alarms inside the Ammonia Machinery Room.

- The second-floor doors open directly to the exterior of the building without a stairway, ladder, or other means to safely exit the building. The doors on the south side contain two sets of chains across the doorway, but would not effectively prevent an individual from exiting the doorway and falling (see Photographs 1 and 32). The doors are not locked and do not contain warning signs. The doors on the first floor (maintenance room) and second floor were not tight fitting (see Photograph 165). The doors on the second floor in the Ammonia Machinery Room opened inward.

- The primary entrance to the Ammonia Machinery Room on the ground floor contains a locked box with a remote emergency stop button for the Ammonia Machinery Room equipment and a ventilation manual override switch (see Photograph 6). According to facility representatives, Brian Coran (the deceased employee) was the only staff person with a key to the box.

- The inspectors observed several instances of open electrical junction boxes, loose wiring, and light sockets without bulbs in the Maintenance Room and in the Ammonia Machinery Room (see Photographs 24 and 187 for examples).

- The Maintenance Room contains an eyewash station near the ground-floor entrance to the building, at the base of the stairway. The eyewash station is not connected to a water supply and no safety shower is present (see Photograph 25). In addition, there are no safety showers or eyewash stations in the Ammonia Machinery Room on the second floor or outside the primary entrance.

- The roof access inside the Ammonia Machinery Room is an aluminum extension ladder located at the second-floor landing of the stairway. The ladder is secured to the roof access panel. The base of the ladder only contains about one foot of space before the first step of the stairway to the first floor and presents a fall hazard (see Photographs 109, 110, and 111).

- Most of the piping and equipment in the Ammonia Machinery Room was inadequately labeled or missing labeling indicating contents, physical state, and direction of flow (see Photographs 115, 123, 124, 125, 132, and 135 for examples).

- The inspectors observed several sections of piping that penetrated the Ammonia Machinery Room wall and were not tight sealing and other unsealed gaps in the walls and floor (see Photographs 115, 116, 117, 120, and 139).

- The Ammonia Machinery Room air intake is a square mechanically louvered opening on the south side of the room near the pressure control receiver and the transfer tank. The motor for the louvers was hanging loosely on the louver rod and would not

function to open the louvers if activated (see Photographs 121, 145, and 196). Additionally, the inspectors observed a piece of plywood leaning against open contacts for the louver motor control, presenting an electrical hazard (see Photograph 196). The power to the Ammonia Machinery Room area had been shut off and the louvers were in the closed positions and did not go to the open position when power to the room was shut down (see Photograph 145).

- The inspectors did not observe a "U" or "UM" stamp signifying compliance with the rules of Section VIII of the ASME Boiler and Pressure Vessel Code for any of the original compressor oil separator pots, which are pressurized vessels greater than six inches in diameter. Additionally, none of these pressure vessels are protected by a pressure-relief device to safely relieve pressure due to fire or abnormal conditions (see Photographs 127, 150, and 151).

- The inspectors observed damaged, stained, and missing insulation in multiple areas on ammonia piping and vessels in the room (see Photographs 123, 131, 140, and 153 for examples).

- None of the isolation valves (i.e., king valves) used for isolating the ammonia in the receivers were clearly labeled and identified as isolation valves. In addition, one isolation valve (manual and automated) Control Pressure Receiver was located approximately eight to ten feet above ground level with no permanent platform or ladder or chain for operation to access the valve in the case of an emergency (see Photograph 124).

- The nameplates for the control pressure receiver, pilot receiver, and low temperature accumulator did not contain a National Board registration number (see Photographs 80, 81, 82, and 119 from the 3/24/16 EPA Inspection Report). Additionally, the transfer tank (Dump Tank) was missing a nameplate altogether (see Photograph 140). As of the date of this inspection report, the facility has not produced U1 or U1A forms for any of the pressure vessels showing that the tanks were fabricated and tested for the operating pressures in the refrigeration system.

- The Pilot Receiver drain valve was not a self-closing valve (see Photograph 157). In addition, multiple drain lines extended from the tanks into walkways and were not protected from physical damage (see Photographs 149 and 157).

- The electrical switchgear room inside of the expansion Ammonia Machinery Room contained electrical conduit that was dripping water from a fitting, indicating that water was present inside the conduit and presenting an electrical hazard (see Photograph 180).

- The inspectors observed the pressure relief valve discharge lines in the Ammonia Machinery Room to be manifolded together into a single relief vent header to the

roof, including the relief line from the 2005 expansion equipment. The inspection team requested relief vent calculations to verify that the vent header is appropriately sized and, as of the date of this report submission, have not received the calculations. The vent line may not be adequately sized to safely vent the equipment in the Ammonia Machinery Room which presents a potential over pressure hazard in the ammonia equipment and piping.

- The inspectors observed a Hansen ammonia detector in the Ammonia Machinery Room near the ceiling. According the ARC representatives and documentation, the detectors have not been calibrated since January 2015. The Hansen Bulletin A100 (February 2008) indicates that bump tests should be completed at least once every six months and calibration of the sensors should be completed annually at a minimum.

- The inspection team did not observe a legible, permanent sign in the Ammonia Machinery Room displaying the following information:
  a) Name and address of the installer
  b) The refrigerant number and the amount of refrigerant in the system
  c) The field test pressure(s) applied

Roof

The inspection team walked around the roof of the building above the Ammonia Machinery Room and Cooler Room B which contains the evaporative condenser, Ammonia Machinery Room exhaust fans, ammonia refrigeration piping, and the relief vent discharge lines. The Ammonia Machinery Room equipment vents to a single vent header that discharges near the evaporative condenser. The inspectors also observed two smaller relief headers for each of the two ice makers in Cooler Room B. Because the Ammonia Machinery Room roof access ladder was deemed to not be safe for use, the BFD provided a ladder truck for access to the roof from the exterior of the building.

Based on the walk around the roof, the inspection team observed the following areas of concern:

- The labeling on the ammonia and natural gas piping and valves was worn or missing in several locations (see Photographs 40, 42, 77, 81, and 91 for examples).

- The roof did not contain guardrails or any other method of fall protection to protect workers within six feet of the roof edge (see Photographs 40, 62, 67, 73, 74, 91, and 97 for examples).

- The inspectors observed several instances of rusted valves and piping around uninsulated valve manifolds (see Photographs 41, 46, 49, 50, 56, 86, and 90 for examples).

- The Ammonia Machinery Room pressure relief vent line is located on the lower roof level (i.e., on the same level as the Ammonia Machinery Room exhaust fans), is less than 7.25 feet above the Cooler Room B roof level (see Photographs 61, 74, and 78). Additionally, the Emergency Exhaust Fan was less than 20 feet from the property line.

- The inspectors observed damaged or missing insulation on piping (see Photograph 76).

Cooler/Freezer Rooms and Loading Dock

The inspection team walked around the cooler rooms, freezer room, and loading dock areas. Cooler Room A is located on the south end of the building and is accessed through a main door from the administrative offices and a garage door from the loading dock. The room also contains the Fish Cutting Room for processing of seafood. Cooler Room A contains pallet racks along the walls and the Cooler Room and Fish Cutting Room contain ceiling-mounted evaporators. The only ammonia detector in the room is located in the center of the room near the ceiling.

The loading dock area runs the length of the building on the east side and contains nine truck loading bays. The area contains evaporators for cooling and natural gas-fired heaters for heating. The space also includes an administrative office on the south side and charging stations for electric powered industrial equipment.

Cooler Room B is located on the north end of the building and is accessed from the loading docks on the east end and through the Jack Room (battery charging room) on the west end. A balcony area is located on the west end of the room and is used as a Transportation Security Administration (TSA) segregation and screening area. Cooler Room B contains pallet racks and two ice making machines along the north wall. The room contains ceiling-mounted evaporators and one ammonia detector near the ceiling in the center of the room along the south wall.

The Freezer Room is located between Cooler Room A and Cooler Room B and is accessed through a single door or two sliding doors from the loading dock. The room contains pallet racks, ceiling-mounted evaporators, and one ammonia detector mounted on the wall near the ceiling.

During the inspection, the facility had rented and installed two skid-mounted R-22 refrigeration systems for keeping product in the Freezer Room cold. The units were located outside the loading dock area and the facility had run hoses pumping cold ethylene glycol along the floor from the exterior of the building into the Freezer Room.

Based on the walk around of the cooler rooms, freezer room, and loading dock, the inspection team observed the following areas of concern:

- The Fish Cutting Room is in an enclosed space within Cooler Room A but does not contain an ammonia detector (see Photographs 200 and 214). Because the room is enclosed, the ammonia detector in Cooler Room A near the ceiling in the center of

the room would not provide adequate warning of an ammonia release and presents a hazard to employees working in the cutting room.

- The copper water piping around the ammonia feed line to the evaporator in the Fish Cutting Room was oxidized with a bluish-green patina indicating that ammonia had been leaking from the refrigeration valves or piping at some point in the past (see Photographs 209, 210, 214, and 215).

- The inspectors observed several pallet racks installed near the ceiling and directly underneath ammonia piping and evaporator units in Cooler Room A (see Photograph 201). In addition, the inspectors observed a damaged drainage pan under one of the Cooler Room A evaporators, indicating that a forklift or other equipment had run into the pan (see Photographs 221, 222, and 225). Based on the position of the pallet racks and damage to the evaporator, the facility has not adequately protected the ammonia system from damage.

- The temporary refrigeration piping and electrical cords running across the floor present a trip hazard for employees working in the area (see Photographs 258 and 279).

- The inspectors observed a total of 13 electric forklifts in the loading dock and battery charging areas (see Photographs 258 and 311 for examples). Based on an inventory of battery weights listed on each unit, the EPA estimated the aggregated battery weight of 30,960 lbs. This equates to 6,192 lbs of sulfuric acid assuming concentration of 20 weight percent and 17,028 lbs of lead assuming a concentration of 55 weight percent. Sulfuric acid is an EPCRA extremely hazardous substance (EHS) with a threshold planning quantity of 1,000 lbs. Lead is a hazardous substance with a threshold planning quantity of 10,000 lbs. The facility did not report sulfuric acid or lead on their EPCRA Section 312 Tier II reports for Reporting Years 2013, 2014, and 2015.

- The loading dock area contains multiple evaporator units and ammonia piping. The room also contains two natural gas-fired heaters at either end of the room (see Photographs 259 and 266). According to facility representatives, neither heater is interlocked with the ammonia detection system. The heaters present an ignition source in the event of an ammonia release.

- The inspectors observed a section of ammonia piping wrapped in insulation (see Photographs 259 and 260). This type of insulation may retain moisture and liquid between the insulation and piping, increasing the likelihood of corrosion.

- The inspectors observed a liquid trap in one of the ammonia lines directly in front and just above one of the loading bay doors (see Photograph 264). Since this area is a

pathway for forklifts loading trucks, the ammonia piping is susceptible to damage from the forklifts or other equipment.

- One of the support legs on an icemaker in Cooler Room B was not bolted to the floor (see Photograph 297).

- The exit doorway to the exterior of the building in the battery charging room was blocked by two electric forklifts (see Photograph 311).

- None of the rooms containing ammonia refrigeration piping and equipment contained audio/visual alarms outside of the rooms to warn personnel in the event of an ammonia release.

Building Perimeter

The inspection team walked around the exterior perimeter of the building. The east end of the building includes the loading bays and parking area for vehicles. During the inspection, the facility had stationed two portable refrigeration units next to the building. Additionally, the inspectors observed approximately six empty and partially filled plastic chemical totes containing ethylene glycol for the portable refrigeration units. The west end of the building includes the alley way access to the administrative offices and the Ammonia Machinery Room. The inspection team observed the following areas of concern:

- The facility contained one windsock on the southwest corner of the building above the administrative offices (see Photograph 31). That part of the building contains a lower roofline than many of the other parts of the building such as the Ammonia Machinery Room and warehouse areas. There were no windsocks located near the Ammonia Machinery Room entrance or near the loading dock area where personnel may enter the area. Lack of windsocks presents a hazard to Stavis employees, truck drivers, and emergency personnel trying to determine the direction of the release plume in the event of a chemical release at the facility.

- The inspectors observed labels on the chemical totes near the portable refrigeration units to be Ashland Chemical Zerex G-48 RTU which is 49 percent ethylene glycol according to publicly available Safety Data Sheets (SDS) (http://s7d9.scene7.com/is/content/GenuinePartsCompany/2447087pdf?PDF*)* (see Photographs 336 through 339). The inspectors requested a copy of the SDS for Zerex G-48-RTU and the contractor responsible for the system was unable to produce the SDS on-site. In addition, the inspectors observed one chemical tote inside the building on the loading dock that did not contain any labels or hazard identification (see Photograph 276). The Stavis representatives stated the inside tote contained glycol for the portable refrigeration systems.

  Based on inspector observations, the facility had seven chemical totes on-site with each tote having at least a 275-gallon capacity (some totes outside were slightly taller than others). Using the SDS density of 1.0729g/cm^3 and assuming the volume of all seven totes was either in the totes or the portable refrigeration systems, the EPA

estimates the facility was storing at least 17,200 lbs of ethylene glycol mixture onsite. Stavis will need to report the ethylene glycol mixture needs to report their SDS under EPCRA 311 within 90 days and will need to be added to their EPCRA 312 Tier II report for 2016. They may also need to report it under EPCRA 313 since they have likely more than 10,000 lbs of ethylene glycol in 2016.

V. OUT-BRIEF/CLOSING CONFERENCE

Inspector Wallace concluded the inspection with an out-brief to facility representatives, discussing the preliminary areas of concern and corrective actions identified during the inspection related to failure to maintain a safe work place and lack of adherence to industry standards for the ammonia refrigeration system. Inspector Wallace emphasized that the findings were preliminary and additional concerns and requested corrective actions would be communicated to the facility after the inspection.

The following corrective action items were identified during the out-brief:

1. Conduct non-destructive testing of piping and vessels
2. Re-rate pressure vessels in ammonia refrigeration system, including the four vessels listed below, or otherwise provide design and testing documentation that the vessels are fit for service:
    a. Pressure Control Receiver – RVS-83017
    b. Pilot Receiver- RVS-83016
    c. Transfer (Dump) Tank – RVS-83005
    d. Low Temperature Accumulator – No RVS number
3. Verify and certify that all small bore (2" diameter and less) anhydrous ammonia piping is Schedule 80.
4. Provide two means of safe egress off of the roof.
5. Provide two means of egress from Ammonia Machinery Room (second floor) and provide barriers or means of fall protection for the two sets of double doors located on the second floor in the Ammonia Machinery Room.
6. Install/repair ammonia detection system and install audio/visual ammonia detection alarms outside of each room containing ammonia piping and equipment.
7. Repair or re-install fire, smoke, and carbon monoxide detection system in Ammonia Machinery Room.
8. Install relief valves on compressor oil separator pots (OS-1 through OS-5) that are missing relief valves.
9. Install safety interlocks to shut down the gas-fired heaters on the loading dock when the presence of ammonia is detected.
10. Install safety interlocks to shut down ancillary electrical equipment (e.g., air compressors, portable lights, etc.) in Ammonia Machinery Room during emergency shutdowns or when remote emergency stop is triggered.
11. Remove remaining oil residue from accident from overhead piping in Ammonia Machinery Room.
12. Paint, insulate, and label all process piping, vessels, equipment, and valves according to industry standards and code.

13. Protect and secure storm drains in and around Ammonia Machinery Room from inadvertent releases of process chemicals to the storm drain system and navigable waters.

Inspector Wallace requested several documents during the out-brief:

1. List of ammonia refrigeration system equipment from 2009 to present
2. Ammonia charge calculations/inventory
3. Ammonia pump-out receipt from March 24, 2016
4. 2009 ARC equipment files
5. If not included in Request #4 above, provide the pressure vessel design information (e.g., U1/U1A Forms) for the pressure control receiver, pilot receiver, transfer tank, low and high temperature accumulators, intercooler vessel, and heat exchangers
6. Ammonia refrigeration system P&IDs from Stahlman 2005 upgrade project
7. M&M Process Control Sequence of Operations Document
8. Ammonia refrigeration system relief valve header sizing calculations
9. ARC Maintenance Books – Preventative Maintenance Agreement (January 1, 2015 – December 31, 2015) and any other ARC Maintenance agreements and binders associated with the ongoing maintenance of Stavis Seafoods from 2013 to present
10. M&M Control System Printout identifying the time the E-Stop button was triggered.
11. M&M Control System Reports for the following:
    a. Temperature and pressure history from January 2016 to present
    b. Alarm history from January 2016 to present
    c. Ammonia detector output history from September 2015 to present for all detectors

VI. FACILITY COMPLIANCE STATUS

Table 1 presents a summary of the areas of concern identified by the EPA inspection team with respect to the CAA Section 112(r) and EPCRA based on the on-site compliance inspection at Stavis facility on April 6, 2016.

Table 1. Stavis Seafoods CAA § 112(r)/EPCRA Compliance Inspection Areas of Concern

Area of Concern	Applicable Historical RAGAGEP	Applicable Current RAGAGEP
The floor drains and tidal sump in the Maintenance Room appear to drain directly to the Boston Harbor with no engineering or administrative controls to prevent oils or other hazardous substances from reaching navigable waters.	• ANSI/IIAR 2-1999, Section 6.3.1.9 • ANSI/ASHRAE 15-2001(Add. A), Section 11.3	• ANSI/IIAR 2-2014, Section 6.9.2 and 6.9.3 • ANSI/ASHRAE 15-2013, Section 11.3

Table 1. Stavis Seafoods CAA § 112(r)/EPCRA Compliance Inspection Areas of Concern

Area of Concern	Applicable Historical RAGAGEP	Applicable Current RAGAGEP
With the exception of the ammonia refrigeration Ammonia Machinery Room, none of the areas containing ammonia piping and equipment contained an audio/visual alarm outside or inside the rooms to warn personnel of the hazard in the event of an ammonia release. The primary entrance to the Ammonia Machinery Room contained a visual alarm light, but no audio alarm and the alarm was not labeled adequately to identify the purpose of the alarm.	• NFPA 1-2003, Section 53.11.2 • ANSI/ASHRAE 15-2001(Add. A), Section 8.11.2.1	• NFPA 1-2012, Section 53.2.3.1 • ANSI/IIAR 2-2014, Sections 6.13.1.3 and 7.2.3 • ANSI/ASHRAE 15-2013, Section 8.11.2.1
The second-floor doors open directly to the exterior of the building without a stairway, ladder, or other means to safely exit the building. The doors on the south side contain two sets of chains across the doorway, but would not effectively prevent an individual from exiting the doorway and falling. The doors are not locked and do not contain warning signs. The doors on the first floor (maintenance room) and second floor were not tight fitting. The doors on the second floor in the Ammonia Machinery Room opened inward and are not self-closing.	• ANSI/IIAR 2-1999, Section 6.3.1.5 • ANSI/ASHRAE 15-2001(Add. A), Section 8.11.2, 8.11.8, 8.12(b), 8.12(d), and 11.2.4	• ANSI/IIAR 2-2014, Sections 6.10 and 6.15.3 • ANSI/ASHRAE 15-2013, Sections 8.11.2, 8.11.8, 8.12(b), 8.12(d), and 11.2.4
The inspectors observed several instances of open electrical junction boxes, loose wiring, and light sockets without bulbs in the Maintenance Room and in the Ammonia Machinery Room.	• NFPA 70(NEC)-2002, Section 110-27	• NFPA 70 (NEC)-2011, Section 110-27 • IIAR Bulletin 109, Section 7 Inspection Checklists • 29 CFR 1910.303(g)(2)

Table 1. Stavis Seafoods CAA § 112(r)/EPCRA Compliance Inspection Areas of Concern

Area of Concern	Applicable Historical RAGAGEP	Applicable Current RAGAGEP
		• ANSI/IIAR 2-2008 Addendum B, 2012. Ed. Section 13.1.7
The Maintenance Room contains an eyewash station inside the ground-floor entrance to the building and at the base of the stairway. The eyewash station is not connected to a water supply and no safety shower is present. In addition, there are no safety showers or eyewash stations in the Ammonia Machinery Room on the second floor or outside the primary entrance.	• ANSI/IIAR 2-1999, Section 6.3.1.4 • IIAR Bulletin 109, Section 4.10.10	• ANSI/IIAR 2-2014, Section 6.7 • IIAR Bulletin 109, Section 4.10.10
The inspectors observed a significant amount of piping and equipment in the Ammonia Machinery Room, roof, and other ammonia-containing areas that was inadequately labeled or missing labeling indicating contents, physical state, and direction of flow.	• ANSI/IIAR 2-1999, Section 7.1.4 • ANSI/ASHRAE 15-2001(Add. A), Section 11.2.2 • IIAR Bulletin 109, Section 4.7.6 • IIAR Bulletin 114	• ANSI/IIAR 2-2014, Section 5.14.5 • ANSI/ASHRAE 15-2013, Section 11.2.2 • IIAR Bulletin 109, Section 4.7.6 • IIAR Bulletin 114 • ASME 13.1 (2007)
The inspectors observed several sections of piping that penetrated the Ammonia Machinery Room wall and were not tight sealing and other unsealed gaps in the walls and floor.	• ANSI/IIAR 2-1999, Section 6.3.1.10 • ANSI/ASHRAE 15-2001(Add. A), Sections 8.11.7 and 8.12(f) • ANSI/ASHRAE 2-2008 (Add. B) Sections 13.1.1.3, 13.1.5.2	• ANSI/IIAR 2-2014, Section 6.6.2 and 6.2.5 • ANSI/ASHRAE 15-2013, Sections 8.11.2, 8.11.7 and 8.12(f)

Table 1. Stavis Seafoods CAA § 112(r)/EPCRA Compliance Inspection Areas of Concern

Area of Concern	Applicable Historical RAGAGEP	Applicable Current RAGAGEP
The Ammonia Machinery Room intake is a square mechanically louvered opening on the south side of the room near the pressure control receiver and the transfer tank. The motor for the louvers was hanging loosely on the louver rod and would not function to open the louvers if activated. Louvers closed when power was off.	• ANSI/IIAR 2-1999, Section 6.2.3.7 • ANSI/ASHRAE 15-2001(Add. A), Section 8.11.4	• ANSI/IIAR 2-2014, Section 6.14.5 And 6.14.5.6 • ANSI/ASHRAE 15-2013, Section 8.11.4
The inspectors did not observe a "U" or "UM" stamp signifying compliance with the rules of Section VIII of the ASME Boiler and Pressure Vessel Code (BPVC) on any of the four original compressor oil separator pots, which are pressurized vessels greater than six inches in diameter. In addition, the transfer (dump) tank was missing the nameplate and the facility was unable to provide documentation showing that the tank was designed and fabricated in adherence to Section VIII of the ASME BPVC. None of the oil separator pressure vessels are protected by a pressure-relief device to safely relieve pressure due to fire or abnormal conditions.	• ANSI/IIAR 2-1999, Sections 5.10.1.2, 5.10.3, and 5.14 • ANSI/ASHRAE 15-2001(Add. A), Sections 9.3.2 and 9.4 • IIAR Bulletin 109, Section 4.3.1.2	• ANSI/IIAR 2-2014, Section 12.2.2, 12.4.1, 15.2.1, and 15.14.4 • ANSI/ASHRAE 15-2013, Sections 9.3.2 and 9.4 • IIAR Bulletin 109, Section 4.3.1.2

Table 1. Stavis Seafoods CAA § 112(r)/EPCRA Compliance Inspection Areas of Concern

Area of Concern	Applicable Historical RAGAGEP	Applicable Current RAGAGEP
The inspectors observed damaged, stained, and missing insulation in multiple areas on ammonia piping and vessels in the Ammonia Machinery Room, roof, and other areas containing ammonia piping. In addition, the inspectors observed a section of ammonia piping wrapped in Armaflex® insulation on the loading dock. This type of insulation retains moisture and liquid between the insulation and piping, increasing the likelihood of corrosion.	• ANSI/IIAR 2-1999, Section 7.2 • IIAR Bulletin 110, Sections 6.7.2 and 6.4.3	• ANSI/IIAR 2-2014, Section 5.10.1 • IIAR Bulletin 110, Sections 6.7.2 and 6.4.3
None of the isolation valves (e.g., king valves) used for isolating the ammonia in the receivers were clearly labeled and identified as isolation valves. In addition, one isolation valve (manual and automated) between the pilot receiver and temperature control receiver was located approximately eight to ten feet above ground level with no permanent platform or ladder or chain for operation to access the valve in the case of an emergency.	• ANSI/IIAR 2-1999, Section 6.1.1.3 • ANSI/ASHRAE 15-2001(Add. A), Sections 9.12.6 and 11.2.2(a) • NFPA 1-2003, Section 53.14.2 • IIAR Bulletin 109, Sections 4.10.3 and Section 7 Inspection Checklists	• ANSI/IIAR 2-2014, Sections 5.14.3 and 6.3.3.2 • ANSI/ASHRAE 15-2013, Sections 9.12.6 and 11.2.2.a. • NFPA 1-2012, Section 53.2.4.2 • IIAR Bulletin 109, Sections 4.10.3 and Section 7 Inspection Checklists
The pilot receiver drain valve was not a self-closing style valve. In addition, multiple drain lines extended from the tanks into walkways and were not protected from physical damage	• ANSI/IIAR 2-1999, Section 7.1.2 • ANSI/ASHRAE 15-2001(Add. A), Section 11.1 • IIAR Bulletin 109, Section 7 Inspection Checklists	• ANSI/IIAR 2-2014, Sections 5.9.3, 5/17.1, 13.4.2, and 7.2.4 • ANSI/ASHRAE 15-2013, Section 11.1 • IIAR Bulletin 109, Section 7 Inspection Checklists

Table 1. Stavis Seafoods CAA § 112(r)/EPCRA Compliance Inspection Areas of Concern

Area of Concern	Applicable Historical RAGAGEP	Applicable Current RAGAGEP
The electrical switchgear room inside of the expansion Ammonia Machinery Room contained electrical conduit that was dripping water from a fitting, indicating that water was present inside the conduit and presenting an electrical hazard.		
The inspection team requested relief vent calculations to verify that the vent header is appropriately sized and, as of the date of this report submission, have not received the calculations.	• ANSI/IIAR 2-1999, Sections 7.3.6 and 7.3.7 • ANSI/ASHRAE 15-2001(Add. A), Sections 9.7.5, 9.7.6, 9.7.7	• ANSI/IIAR 2-2014, Sections 15.3.7 and 15.5 • ANSI/ASHRAE 15-2013, Sections 9.7.5, 9.7.6, 9.7.7
The inspectors observed Hansen ammonia detectors in the Ammonia Machinery Room, the cooler rooms, the freezer room, and the loading dock area near the ceiling. According the ARC representatives and documentation, the detectors had not been calibrated since January 2015 and no record of bump tests since then was provided. The Hansen Bulletin A100 (February 2008) indicates that bump tests should be completed at least once every six months and calibration of the sensors should be completed annually at a minimum.	• ANSI/IIAR 2-1999, Section 6.2.2 • ANSI/ASHRAE 15-2001(Add. A), Section 11.6.3 • NFPA 1-2003, Sections 53.11.5, 53.15.2, 53.15.3, and 53.15.5 • IIAR Bulletin 110, Section 10.6.6.4	• ANSI/IIAR 2-2014, Section 17.3 • ANSI/ASHRAE 15-2013, Section 11.6.3 • NFPA 1-2012, Sections 52.2.3.1.7, 53.3.2.2, 53.3.2.3, and 53.3.2.4 • IIAR Bulletin 110, Section 10.6.6.4

Table 1. Stavis Seafoods CAA § 112(r)/EPCRA Compliance Inspection Areas of Concern

Area of Concern	Applicable Historical RAGAGEP	Applicable Current RAGAGEP
The machinery did not contain a legible, permanent sign securely attached and easily accessible in any location on the ammonia refrigeration system displaying the following information: a) Name and address of the installer b) The refrigerant number and the amount of refrigerant in the system c) The field test pressure(s) applied	• NFPA 1-2003, Section 53.14.1 • ANSI/ASHRAE 15-2001(Add. A), Section 11.2.1 • IIAR Bulletin 109, Sections 4.10.4 and 7 - Inspection Checklists	• NFPA 1-2012, Section 53.2.4.1 • ANSI/IIAR 2-2014, Section 5.15 • ANSI/ASHRAE 15-2013, Section 11.2.1 • IIAR Bulletin 109, Sections 4.10.4 and 7 - Inspection Checklists
The roof did not contain guardrails or any other method of fall protection to protect workers within six feet of the roof edge.	• 29 CFR 1910.501(b)(1)	• 29 CFR 1910.501(b)(1)
The inspectors observed several instances of rusted valves and piping around uninsulated valve manifolds.	• NFPA 1-2003, Section 53.5.3 • IIAR Bulletin 109, Sections 4.7.4 and 4.7.5 • IIAR Bulletin 110, Section 6.7. • IMC 2009 Section 1101.17	• NFPA 1 (2012), Section 53.3.1.1 • IMC 2012, Section 1101.7 (where applicable) • ANSI/IIAR 2-2014, Section 13.4.2 • IIAR Bulletin 109, Sections 4.7.4 and 4.7.5 • IIAR Bulletin 110, Section 6.7

Table 1. Stavis Seafoods CAA § 112(r)/EPCRA Compliance Inspection Areas of Concern

Area of Concern	Applicable Historical RAGAGEP	Applicable Current RAGAGEP
The Ammonia Machinery Room pressure relief vent line is located on the lower roof level (i.e., on the same level as the Ammonia Machinery Room exhaust fans), is less than 7.25 feet above the Cooler Room B roof level. The Emergency Exhaust Fan was less than 20 feet from the property line.	• NFPA 1-2003, Section 53.8.3.2 • ANSI/IIAR 2-1999, Section 7.3.2 • ANSI/ASHRAE 15-2001(Add. A), Section 9.7.8	• NFPA 1-2012, Sections 53.2.2.1.2(2), 53.2.3.3.12 • ANSI/IIAR 2-2014, Sections 15.5.1.3 and 6.14.3.4 • ANSI/ASHRAE 15-2013, Section 9.7.8 • IMC 2012, Section 1105.7 (where applicable)
The Fish Cutting Room is in an enclosed space within Cooler Room A but does not contain an ammonia detector. Because the room is enclosed, the ammonia detector in Cooler Room A near the ceiling in the center of the room would not provide adequate warning of an ammonia release and presents a hazard to employees working in the cutting room.		• ANSI/IIAR 2-2014, Section 7.2.3
The copper water piping around the ammonia feed line to the evaporator in the Fish Cutting Room was oxidized with a bluish-green patina indicating that ammonia had been leaking from the refrigeration valves or piping at some point in the past.	• IIAR Bulletin 109, Section 4.10.8	• IIAR Bulletin 109, Section 4.10.8

Table 1. Stavis Seafoods CAA § 112(r)/EPCRA Compliance Inspection Areas of Concern

Area of Concern	Applicable Historical RAGAGEP	Applicable Current RAGAGEP
The inspectors observed pallet racks installed near the ceiling and directly underneath ammonia piping and evaporator units in Cooler Room A. The inspectors observed a damaged drainage pan under one of the Cooler Room A evaporators, indicating that a forklift or other equipment had run into the pan. The inspectors also observed a low unprotected liquid trap on ammonia piping running above one of the loading dock bays. Based on the position of the pallet racks, damage to the evaporator, and position of the loading dock piping, the facility has not adequately protected the ammonia system from damage.	• ANSI/ASHRAE 15-2001(Add. A), Section 11.1 • IIAR Bulletin 109, Section 7 Inspection Checklists	• ANSI/IIAR 2-2014, Sections 5.17.1 and 7.2.4 • ANSI/ASHRAE 15-2013, Section 11.1 • IIAR Bulletin 109, Section 7 Inspection Checklists
The temporary refrigeration piping and electrical cords running across the floor in the loading dock area present a trip hazard for employees working in the area.		
The loading dock area contains multiple evaporator units and ammonia piping. The room also contains two natural gas-fired heaters at either end of the room. According to facility representatives, neither heater is interlocked with the ammonia detection system. The heaters present an ignition source in the event of an ammonia release.	• ANSI/IIAR 2-1999, Section 6.1.1.5	
One of the support legs on an icemaker in Cooler Room B was not bolted to the floor.	• IIAR 2-2008 (Add B, 2012, ed). Section 14.4.1`	• IIAR 2-2008 (Add. B, 2012, ed) Section 14.4.1
The exit doorway to the exterior of the building in the battery charging room was blocked by two electric forklifts.		

Table 1. Stavis Seafoods CAA § 112(r)/EPCRA Compliance Inspection Areas of Concern

Area of Concern	Applicable Historical RAGAGEP	Applicable Current RAGAGEP
The facility contained only one windsock on the southwest corner of the building above the administrative offices (see Photograph 31). That part of the building contains a lower roofline than many of the other parts of the building such as the Ammonia Machinery Room and warehouse areas. There were no windsocks located near the Ammonia Machinery Room entrance or near the loading dock area where personnel may enter the area. Lack of windsocks presents a hazard to Stavis employees, truck drivers, and emergency personnel in the event of a chemical release at the facility.	• 29 CFR 1910.119 Appendix C	• 29 CFR 1910.119 Appendix C • ANSI/IIAR 2-2014, Section 5.14.6
The inspectors observed a total of 13 electric forklifts in the loading dock and battery charging areas. Based on an inventory of battery weights listed on each unit, the EPA estimated the aggregated battery weight of 30,960 lbs. This equates to 6,192 lbs of sulfuric acid assuming a concentration of 20 weight percent and 17,028 lbs of lead assuming a concentration of 55 weight percent. Sulfuric acid is an EPCRA extremely hazardous substance (EHS) with a threshold planning quantity of 1,000 lbs. Lead is a hazardous substance with a threshold planning quantity of 10,000 lbs. The facility did not report sulfuric acid or lead on their EPCRA Section 312 Tier II reports for Reporting Years 2013, 2014, and 2015.	• 40 CFR 370.10	• 40 CFR 370.10

Table 1. Stavis Seafoods CAA § 112(r)/EPCRA Compliance Inspection Areas of Concern

Area of Concern	Applicable Historical RAGAGEP	Applicable Current RAGAGEP
The inspectors observed one chemical tote inside the building on the loading dock reportedly containing a 49-percent ethylene glycol mixture that did not contain any labels or hazard identification. Also, the facility did not identify the glycol type (i.e., ethylene or propylene) or amount of glycol solution in the facility's permanent glycol system used for under-floor temperature control.	• 40 CFR 370.10	• 29 CFR 1200(b)(4)(i) • 40 CFR 370.10

VII. ENFORCEMENT HISTORY

The facility has no reported violations in ECHO.

VIII. ENVIRONMENTAL JUSTICE

The national EJSCREEN mapping tool indicates that the Facility is located in area of Environmental Justice interest.

IX. AMMONIA EXPERT OPINION

After review of the EPA's inspection report for the March 24, 2016 inspection, I (Larry Aleksandrich) concur with the areas of concern identified by the EPA inspection team in that report based my personal observations of the facility during the April 6, 2016 inspection and discussions with Inspector Wallace.
Sincerely, Larry Aleksandrich

LARRY ALEKSANDRICH
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CARTERET, NJ 07008
Aleksandrich Compliance & Engineering Services LLC

Ms. Catherine Smith
Ms. Laura Berry
Mr. Leonard Wallace
EPA Region 1
Boston, MA

June 1, 2016

Prepared By:
Larry Aleksandrich

SUBJECT:
Stavis Seafoods Facility – Critical Actions List
7 Channel Street
Boston, MA 02210

PURPOSE:

The purpose of this report is to provide a list of items that are critical right now to provide safe operation and protect the neighborhood and facility employees working or living near the Stavis Seafoods facility located in Boston, MA.

There are many critical areas of concern that must be addressed immediately.

I (Larry Aleksandrich) have listed the critical items below:

a. Conduct non-destructive testing of ammonia refrigeration system piping and vessels. The testing should include ultrasonic testing or another equivalent test method to evaluate the fitness-for-service of each component on the system. Additionally, the nipple weld on the pilot receiver where the line break occurred should be penetrant tested.

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b. Re-rate pressure vessels in ammonia refrigeration system, including the vessels listed below, or otherwise provide design and testing documentation that the vessels are fit for service:
    i. Pressure Control Receiver – RVS-83017
    ii. Pilot Receiver- RVS-83016
    iii. Transfer (Dump) Tank – RVS-83005
    iv. Low Temperature Accumulator – No RVS number
    v. Compressor Oil Separators
    vi. Oil pots
c. Verify and certify that all small bore (2" diameter and less) anhydrous ammonia piping are Schedule 80.
d. Provide vessel relief calculations for all vessels including the icemakers.
e. Provide relief header calculations.
f. Provide ventilation calculations for the Ammonia Machinery Room.
g. Replace the relief valves on the Pilot Receiver.
h. Pressure test (150psig low side and 250psig high side) the entire system prior to charging ammonia for 48 hours.
i. Vacuum test (1000 microns) for 24 hours prior to charging ammonia.
j. Install relief valves on compressor oil separator pots (OS-1 through OS-5) that are missing relief valves.
k. Replace and calibrate the ammonia detectors in the Ammonia Machinery Room.
l. Install and verify safety interlocks to shut down the gas-fired heaters on the loading dock when the presence of ammonia is detected.
m. Install and verify safety interlocks to shut down refrigeration equipment (e.g., compressors) in Ammonia Machinery Room during emergency shutdowns or when remote emergency stop is triggered.
n. Install and verify safety interlocks to shut down ancillary electrical equipment (e.g., air compressors, portable lights, etc.) in Ammonia Machinery Room during emergency shutdowns or when remote emergency stop is triggered.
o. Modify M&M control system to prevent ammonia detectors being put in bypass for more than an hour during maintenance.

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p. Install/repair ammonia detection system and install audio/visual ammonia detection alarms outside of each room containing ammonia piping and equipment.
q. Re-Install fire/smoke and Carbon Monoxide detection system in Ammonia Machinery Room.
r. Provide proper relief header discharge height for the Ice maker relief piping.
s. Provide proper relief header discharge height for the main relief header.
t. Remove the Armaflex insulation on the dock piping and evaluate the condition of the piping.
u. Provide two means of egress off of the roof.
v. Provide two means of egress from Ammonia Machinery Room (second floor) and provide barriers or means of fall protection for the two sets of double doors located on the second floor in the Ammonia Machinery Room.
w. Protect and secure storm drains in and around Ammonia Machinery Room from inadvertent releases of process chemicals to the storm drain system and navigable waters.
x. Remove remaining oil residue from accident from overhead piping in Ammonia Machinery Room.
y. Paint, insulate, and label all process piping, vessels, equipment, and valves according to industry standards and code.
z. Conduct a hazard review on the ammonia refrigeration system.

Therefore, in my professional opinion, due to the potential exposure to employees, the refrigeration contractor employees, and the general public, I would recommend that the ammonia refrigeration system be shut down and pumped out (including water scrubbing of the remaining vapor) until the critical items are addressed.

I would recommend that a qualified ammonia contractor and the facility personnel develop a schedule to address the critical items immediately. Any delays would put the employees and the general public at extreme risk. I believe that the repairs would exceed thirty days to complete and possibly up to three months to complete.

Please let me know if there are any questions concerning this report.

Thanks,

Larry Aleksandrich

ATTACHMENT 3

STAVIS SEAFOODS, INC. ("STAVIS")
INFORMATION REQUEST

Guidance on How to Respond. You must submit all responsive documents. Please respond separately to each of the questions, referencing each question by paragraph or subparagraph number in your answer. The response must include copies of all documents that you reference in your response or which you feel are relevant to the information being requested.

As part of your response, please complete the enclosed declaration and provide a cover letter carefully specifying what documentation is included to answer each question. (If documents requested in response to one item duplicate those requested by another question, submit only one copy of the documentation.) Your submission must be a self-explanatory, complete response that is dated and signed by an authorized facility official.

Continuing Obligation to Provide/Correct Information. If additional information or documents responsive to these questions become known or available after answering this request, including, but not limited to, specific information that may be deemed unknown at the time of your response, EPA hereby requests, pursuant to Section 114(a)(1) of the CAA, 42 U.S.C. § 7414(a)(1), Section 3007 of RCRA, 42 U.S.C. § 6927, and Section 104(e) of CERCLA, 42 U.S.C. § 9604(e), that you supplement your response to EPA within ten (10) days of discovering such information. If at any time after the submission of this response, you discover or believe that any portion of the submitted information is incomplete or misrepresents the truth, notify Leonard Wallace of this fact as soon as possible and provide EPA with a corrected response.

Confidential Business Information ("CBI"). The information requested herein must be provided even though Stavis may contend that it includes possible confidential information or trade secrets. You may, if you desire, assert a confidentiality claim covering part or all of the information requested, pursuant to Section 114(c) of the CAA, 42 U.S.C. § 7414(c), Section 3007(b) of RCRA, 42 U.S.C. § 6927(b), Section 104(e) of CERCLA, 42 U.S.C. § 9604(e), and 40 C.F.R. Section 2.203(b), by attaching to such information at the time it is submitted a cover sheet, stamped or typed legend, or other suitable form of notice employing language such as "trade secret," or "proprietary," or "company confidential." Information covered by such a claim will be disclosed by EPA only to the extent, and only by means, of the procedures set forth in the statute and regulation identified above. If no such claim accompanies the information when it is received by EPA, it may be made available to the public by EPA without further notice to you. You should read the above cited regulations carefully before asserting a business confidentiality claim, since certain categories of information are not properly the subject of such a claim.

Please note the burden of proof is on you to demonstrate that information claimed as confidential satisfies the criteria set forth in 40 C.F.R. § 2.208. If any portion of your response contains information which you claim as confidential, you must submit two copies of any such "confidential business information" in accordance with the following procedures:

1) The first copy of any document containing such "confidential business information" must be complete and contain all information. Additionally, each such page must be marked conspicuously to indicate that it is claimed as confidential. This copy must be submitted in hard copy form.

2) The second copy of any document that is subject to a CBI claim must be redacted so that it contains only information that is not claimed as confidential.

Definitions. The following definitions shall apply to the following words as they appear in this Attachment 2:

The term "you" or "Stavis Seafoods, Inc." or "Stavis" shall include Stavis Seafoods, Inc. and Stavis Seafoods Limited Partnership, the addressees of this Request, the addressees' officers, managers, employees, contractors, trustees, partners, successors, assigns, and agents.

The term "person" shall have the same definition as in Section 302(e) of the CAA; Section 1004(15) of RCRA, and Section 101(21) of CERCLA, 42 U.S.C. § 9601(21) (*i.e.*, an individual, trust, firm, joint stock company, corporation (including a government corporation), partnership, association, State, municipality, commission, political subdivision of a State, interstate body, or any agency, department, or instrumentality of the United States, and any officer, agent, or employee thereof).

The term "Facility" means the fresh and frozen seafood processing and distribution facility (including all physical structures) operated by Stavis at 7 Channel Street, Boston, Massachusetts 02210.

The term "document" means any object that contains, records, stores or presents information, whether in paper, electronic or any other form. The term "document" includes the original or an identical and readable copy thereof, and all non-identical copies (whether different from the original by reason of notation made on such copies or otherwise).

The term "identify" means, with respect to a natural person, to set forth the person's name, present or last known business address and business telephone number, present or last known home address and home telephone number, and present or last known job title, position or business.

The term "identify" means, with respect to a corporation, partnership, business trust or other association or business entity (including a sole proprietorship), to set forth its full name, address, legal form (*e.g.*, corporation, limited liability company, partnership, etc.), organization, if any, and a brief description of its business.

The term "identify" means, with respect to a document, to provide its customary business description, its date, its number, if any (invoice or purchase order number), the identity of the author, addressor, addressee and/or recipient, and the substance or the subject matter.

The term "raw material(s)" means all chemicals or other materials, regardless of whether they are provided by a Stavis customer or purchased by Stavis, that are used or have been used by Stavis to formulate, mix, package, and/or process products for its customers.

The terms "and" and "or" shall be construed either disjunctively or conjunctively as necessary to bring within the scope of this Information Request any information which might otherwise be construed to be outside its scope.

All terms not defined herein shall have their ordinary meaning, unless such terms are defined in the Clean Air Act, the Resource Conservation and Recovery Act, the Comprehensive Environmental Response, Compensation, and Liability Act, or their implementing regulations, in which case the statutory or regulatory definitions shall apply.

A requested document, item or information shall be deemed to be in your possession, custody or control if you know where it is and can obtain access to it, even if it is not presently in your possession.

Stavis Seafoods Information Request Questions

Provide a separate numbered response to each numbered paragraph or subparagraph below. To the extent that you believe that you have answered a question in another section, please refer to the section and answer you have provided.

A. Company Background:

Provide the following information about the Stavis Seafoods businesses, including, but not limited to, Stavis Seafoods, Inc. and Stavis Seafoods, LP:

1. Describe the ownership and business structure of the Stavis Seafoods businesses, including the relationship between Stavis Seafoods, Inc. and Stavis Seafoods, LP;

2. Indicate the date(s) and state(s) of incorporation of the Stavis Seafoods businesses, including Stavis Seafoods, Inc. and Stavis Seafoods, LP;

3. Identify all corporate officers by name and job title;

4. Identify any parent and subsidiary corporations and divisions;

5. Provide the net worth of the Stavis Seafoods businesses;

6. Identify the owner of the property located at 7 Channel Street, Boston, MA 02210 ("the Facility"). Identify the owner of the Facility building at the property, if different than the property owner.

7. The following questions pertain to the Stavis Seafoods Facility located at 7 Channel Street, Boston, MA 02210.

B. Facility Employees:

8. Identify who was responsible for environmental compliance at the Facility as of March 23, 2016.

9. Identify who is currently responsible for environmental compliance at the Facility.

10. Designated Operator of Ammonia Refrigeration System:

    i. Describe the nature of Brian Caron's employment at the Facility, including job title(s) and dates of employment in each job function.

    ii. Identify who was the Facility's designated operator of the ammonia refrigeration system prior to Brian Caron and the dates of his/her tenure in this position.

    iii. Provide information, including training records, on who will be the Facility's designated operator of the ammonia refrigeration system going forward.

    iv. Provide information about all other employees at the Facility who worked on and/or maintained the Facility's ammonia refrigeration system.

11. Identify any employees at the Facility who have been trained as Hazardous Materials ("HazMat") technicians (OSHA Level 3).

12. Identify any employees at the Facility who have had incident commander training and provide all incident commander training records.

C. Facility Inspection Documents: (For questions 14-16, Stavis Seafoods need only supply EPA with reports that pertain to the ammonia refrigeration system and the room below the Ammonia Machinery Room.)

13. Provide copies of all correspondence from the Facility's insurance company(ies) regarding the Facility's ammonia refrigeration system, including, but not limited to, insurance inspection reports, ammonia system evaluations made for insurance purposes, and customer letters from insurance auditors for the Facility.

14. Provide a copy of any Boston Inspectional Services inspection reports for the last three years.

15. Provide a copy of any Boston Fire Department inspection reports for the last three years.

16. Provide copies of all materials, including permit applications, submitted by the Facility to the Boston Fire Department pursuant to 527 CMR 33.04.

17. Provide copies of all evaluations of the Facility's ammonia refrigeration system made by any third parties, including, but not limited to, contractors bidding to perform maintenance activities at the Facility.

18. Provide copies of any and all photographs of the ammonia refrigeration system at the Facility from 2014 to the present.

D. Technical Information about the Facility's Ammonia Refrigeration System and Process Hazard Review:

19. Provide a copy of any Block Flow Diagram for the Facility's ammonia refrigeration system.

20. Provide a copy of any piping and instrumentation diagrams (P&IDs) for the Facility's Ammonia Machinery Room. Also, there appeared to be a more comprehensive P&ID for the Facility in American Refrigeration Company's files, but the P&ID posted in the Ammonia Machinery Room was missing equipment in the Ammonia Machinery Room. Did Stavis have a complete P&ID at the Facility itself?

21. Provide specification sheets and user manuals for the ammonia monitoring system used to detect ammonia leaks in the Ammonia Machinery Room, Coolers, and Freezer.

22. Provide specification sheets and user manuals for the Facility's portable combustible gas meter.

23. Provide a copy of any maintenance and calibration records for the portable combustible gas meter for the past three years.

24. Provide ventilation design records and calculations for the Ammonia Machinery Room and the Maintenance Storage Room below.

25. Provide specification sheet and user manuals for the automatic ventilation system in the Ammonia Machinery Room and the Maintenance Storage Room below, including, but not limited, to intake louvers and exhaust fans.

26. Provide the ammonia refrigeration system relief valve header sizing calculations and documents sufficient to show the relief system design, the design basis, and maintenance for any and all pressure relief values on the Facility's ammonia refrigeration system.

27. Provide the specification sheet, user manual and any other documents that describe the functioning of the M&M Refrigeration Process Control System and Monitor.

    i. Provide documents that describe what the alarm codes mean.

    ii. Describe and provide documents showing how the emergency/remote controls outside the Ammonia Machinery Room function.

    iii. Describe and provide documents regarding what equipment and/or electrical systems are shut down by the Facility's M&M Refrigeration Control System, including what ammonia levels cause the system to shut down and which fans are activated.

28. Provide any written process hazard reviews that Stavis Seafoods or its contractors have conducted since 2003. Also, the Ammonia Refrigeration Management Program obtained from Mr. Caron's computer contains a hazard review checklist that is blank except for the first page. If available, provide the completed version of that checklist.

29. Provide a list of all intrinsically safe equipment in the Ammonia Machinery Room.

30. Provide any and all specification sheets or other documents related to the pipe attached to the bottom of the Pilot Receiver that was damaged during the March 23, 2016 ammonia release from the Facility.

31. For the Facility's four oil separator tanks in the Facility's Ammonia Machinery Room, provide: (a) all design specification information; (b) as-built documentation; and (c) photographs of the nameplates of each tank.

E. Training Records for Facility Employees (If these training records are voluminous or include records for numerous employees who have not been employed at the Facility in the last five years, Stavis may discuss with EPA whether it is appropriate to narrow this request):

32. Provide a copy of safety and health training records for all Stavis employees at the Facility who entered the Ammonia Machinery Room, even periodically, including for emergency response (*e.g.*, HazMat Team members), chemical hazard communication and electrical safety training.

33. Provide a copy of First Responder (Awareness) training records for all Facility employees.

34. Provide a copy of HazMat technician training records.

35. Provide a copy of Incident Commander training records.

36. Provide a copy of any First aid and CPR training records

37. The training log in the Facility's Ammonia Refrigeration Management Program obtained from Mr. Caron's computer is blank. Is there a filled-out version of that log? If so, please provide it.

F. Ammonia Refrigeration Management Program:

38. Provide a complete copy of any written Process Safety Management (PSM) or Ammonia Refrigeration Management program, including any PSM-related program prepared for the Commonwealth of Massachusetts.

39. Provide a copy of any company Safety Manual information that relates to ammonia, electrical safety, and ladder safety.

40. Provide a complete set of operating procedures that relate to the ammonia refrigeration system.

41. Provide a copy of the company's written hazard communication program.

42. Provide a copy of any documentation of emergency response or emergency evacuation drills for the past 3 years, including any evaluation of responses / drills performed.

43. Provide the name(s) and contact information for any persons or company that performed work at the Facility within the last three years in the Ammonia Machinery Room area. Supply a copy of all documents for the work performed.

44. Provide documentation of any medical surveillance of HazMat Team members.

45. Provide a copy of any personal protective equipment (PPE) hazard assessment for the facility including any monitoring / evaluation done to determine the level of protective equipment required for HazMat team members.

46. Provide a copy of any written respirator program.

47. Provide a copy of any emergency eye wash / shower inspections and servicing records.

48. State where PPE was kept for routine oil draining operations. Also, state whether employees typically wore PPE when draining oil in the Ammonia Machinery Room.

G. Maintenance of the Ammonia Refrigeration System at the Facility:

49. Provide copies of all documents related to maintenance, including maintenance logs, that were created and/or kept by Brian Caron regarding the Ammonia Refrigeration System at the Facility.

50. Provide a list of any industry standards that the Facility used to govern the inspection, testing, and maintenance of its ammonia refrigeration systems.

51. Provide a timeline of the ammonia refrigeration system equipment upgrades, installations, and/or renovations at the Facility, including ammonia inventories, from 1984 to the present. Provide the contracts for this work. Also provide any written evaluations used to manage changes made to the refrigeration system.

52. Provide copies of all orders and invoices for work performed for the last three years on the Facility's ammonia refrigeration system, including repairs.

53. Provide a timeline for all anhydrous ammonia that was charged into the Facility's ammonia refrigeration system, including quantities of anhydrous ammonia.

54. Provide a timeline of all times the ammonia refrigeration system was pumped out, the quantity of ammonia that was pumped out, and when any ammonia releases occurred.

55. Provide copies of the maintenance records for all the exhaust fans in the Ammonia Machinery Room area for the last three years.

56. Provide copies of the maintenance records for all the powered louvers in the Ammonia Machinery Room area for the last three years. Also, during the March 24, 2016 and the April 6, 2016 inspections, the louvers were not working. Specify how long the louvers had not been working before those dates.

57. Provide any and all documents related to the maintenance of the M&M ammonia monitoring system at the Facility including documents related to ammonia sensor calibration and sensor replacement, from January 1, 2012, to the present.

58. According to the M&M system's monitor printout, ammonia detectors were disabled in the Ammonia Machinery Room from January 28, 2016 through March 2016 although, from the printout, the detectors appeared to be reading out levels of ammonia in parts per million. Describe the functionality and problems with the detectors during this time frame and specify whether the detectors were automatically triggering alarms and the ventilation system during that time.

59. Provide a copy of any documents describing any boiler and pressure vessel testing performed by any third party since 2003, including any testing of piping for corrosion, wear, etc.

60. Provide any and all documents related to the maintenance of the Pilot Receiver involved in the ammonia release on March 23, 2016 at the Facility, and any and all documents related to the maintenance of the materials that were directly attached to the Pilot Receiver, including the pipe that was damaged on March 23, 2016.

61. Provide a copy of any maintenance and testing records for valves associated with the refrigeration system since 2003.

62. Specify how long the white tub of oil depicted in photo P3230056 had been present and full of oil before the ammonia release occurred on March 23, 2016. Also, state whether any oil draining activities were planned for March 23, 2016.

63. Provide logs for oil draining from the equipment in the Ammonia Machinery Room.

64. The preventative maintenance documents downloaded from Mr. Caron's computer on March 24, 2016 only contained the cover page for the Ammonia Refrigeration Management Program's "Preventative Maintenance" section. Please provide the rest of that section, if available.

65. Provide any and all communications regarding any and all problems with or concerns about the ammonia refrigeration system at the Facility between 2008 and the present, including any documents related to complaints about the ammonia refrigeration system made by employees or others.

66. Provide any and all documents related to any decisions Stavis made not to: (a) purchase parts for the ammonia refrigeration system at the Facility; (b) update the ammonia refrigeration system at the Facility; and (c) perform maintenance on the Facility's ammonia refrigeration system.

67. Provide any and all documents related to Stavis' consideration and decisions regarding closing or moving the Facility that involve the Facility's ammonia.

68. Provide a copy of all recordings, including video and audio, from the Facility's security monitoring system, including video cameras, from midnight, March 23, 2016 through midnight March 24, 2016. In particular, EPA is interested in obtaining the feed from the security camera opposite the blue main door to the AMR/maintenance area.

H. American Refrigeration Company, Inc. ("ARC"):

69. Describe ARC's roles and responsibilities at the Facility.

70. Provide any and all agreements and modifications to agreements between you and American Refrigeration Company ("ARC") related to the Facility for the last three years, including, but not limited to: "ARC Maintenance Books – Preventative Maintenance Agreement (January 1, 2015 – December 31, 2015).

71. Provide a list of all ARC employees who performed work at the Facility in the last three years and provide copies of their training records.

72. Provide any and all documents related to Brian Caron's communications with ARC between March 20, 2016 and March 23, 2016, including any telephone records, e-mails, letters, text messages, or other correspondence.

I. Chemicals at the Facility:

73. Provide an inventory of all chemicals at the Facility, including Safety Data Sheets (SDSs) for each chemical, including, but not limited to:

    i. An inventory of the amount of anhydrous ammonia at the Facility in the last three years;

    ii. An inventory of the amount of Lead Acid Batteries in the electric forklifts and trucks at the Facility in the last three years; and,

    iii. An inventory of the amount of Glycol solution at the Facility and the type of Glycol in the Facility's system for the last three years.

74. Provide a copy of all EPCRA chemical inventory reports filed since 2014 and specify the state or local agencies with which they were filed.

75. Provide a copy of any EPCRA follow-up reports submitted to state and local agencies pursuant to 40 C.F.R. § 355.40(b).

76. Provide all records of ammonia deliveries to the Facility from 2003 to the present.

J. Compliance with the Resource Conservation and Recovery Act (RCRA):

77. The following questions relate to a letter, dated April 14, 2016, from Tanner Industries, Inc. to Mr. Carlos Rita, American Refrigeration Company, Inc. In the letter, Tanner Industries described how ammonia was removed from the Facility on April 1, 2016. The letter described the removed ammonia as "'off-spec' material (poor quality)." With regard to the characterization of this material, please respond to the following questions:

    i. Quantify the amount of ammonia removed from Facility on April 1, 2016;

    ii. Completely describe all factors that were considered in characterizing this material as "off-spec." If any type of field or laboratory analysis was conducted on the ammonia removed from the system to make this conclusion, please provide copies. If methods other than laboratory analysis were used to make this determination, fully describe these considerations, and how they support the removed material as not being subject to RCRA;

    iii. Identify the person or persons responsible for characterizing the removed ammonia as a hazardous material. Please provide contact information for this (these) people, including work telephone numbers, and e-mail addresses; and,

    iv. Provide complete copies of the shipping documents used to transport the material removed from the Facility on April 1, 2016 to its ultimate destination.

78. On April 4, 2016, 500-gallons of ammonia-contaminated water was removed from the Facility. This material was shipped to Tradebe in Newington, NH as non-regulated waste. With regard to the characterization of this material, please respond to the following questions:

    i. Completely describe all factors that were considered in characterizing this material as non-regulated material. If any type of field or laboratory analysis was conducted on this material to make this conclusion, please provide copies. If methods other than laboratory analysis were used to make this determination, fully describe these considerations, and how they support the removed material as not being subject to RCRA; and,

    ii. Identify the person or persons responsible for characterizing the removed ammonia as a hazardous material. Please provide contact information for this (these) people, including work telephone numbers, and e-mail addresses.

79. The following questions relate to material removed from the Facility on April 5, 2016. On April 5, 2016, 500-pounds of waste mineral oil was removed from the Facility. This material was shipped to Clean Harbors, Braintree, MA as non-regulated waste. With regard to the characterization of this material, please respond to the following questions:

i. Completely describe all factors that were considered in characterizing this material as non-regulated. If any type of field or laboratory analysis was conducted on this material to make this conclusion, please provide copies. If methods other than laboratory analysis were used to make this determination, fully describe these considerations, and how they support the removed material as not being subject to RCRA; and,

ii. Identify the person or persons responsible for characterizing the removed ammonia as a hazardous material. Please provide contact information for this (these) people, including work telephone numbers, and e-mail addresses.

K. Questions Regarding Facility's Ammonia Release Emergency Response Plan:

80. Identify who developed the Facility's Ammonia Release Emergency Response Plan ("ERP") and when it was developed. Provide a final signed copy of the ERP.

81. Identify the Facility's past and current Operations Manager.

82. Identify and describe the role of Vice President of Operations/Operations Manager as mentioned in Section 1.2.1(a) of the ERP.

83. Describe and distinguish the "incident response team," "incident team," and "emergency response team" that are mentioned in Section 1.2.1(f) and (h) of the ERP.

84. Identify the shift refrigeration supervisors.

85. Describe how Stavis Seafoods employees would work in conjunction with American Refrigeration Company, Inc. on the Facility's refrigeration system as part of the Incident Team, as mentioned in in Section 1.2.1(h) of the ERP. Identify the Stavis Seafoods employees who coordinate with American Refrigeration Company, Inc.

86. Describe what is meant by "Sound the gas alarm" in Section 1.2.1(h) of the ERP.

87. Describe how the Facility would find the source of any ammonia releases at the Facility. Describe how the Facility can measure ammonia concentrations if a release occurs.

88. Identify the Plant Safety Director described in Section 1.2.2 of the ERP.

89. According to the ERP, all Facility employees are trained to the Level 1- First Responder Awareness level. Provide first responder awareness training documentation for all employees.

90. Identify the three employees who are described as trained as HazMat Technicians (Level 3). Provide training documentation for these employees.

91. According to Section 1.2.2 of the ERP, the Vice President, Operations Manager, and Plant Engineer will all be trained to Level 5 as HAZMAT Incident Commanders. Identify the personnel who hold these titles and who received this Incident Commander training. Provide training documentation for these employees.

92. According to Section 1.3.1(c) of the ERP, "[the Facility's] refrigeration department has been designed with intrinsically safe electrical equipment…" Identify and describe this intrinsically safe equipment.

93. Describe the operation of the Facility's automatic ventilation system including what ammonia concentration causes the automatic ventilation system to activate.

94. According to Section 1.3.1(c) of the ERP, a combustible gas meter must be used in all anhydrous ammonia incidents as a backup for the automatic ventilation system. Identify the location of the combustible gas meter.

95. According to Section 1.3.1(d) of the ERP, a copy of the Facility's written hazard communication program and copies of all Material Safety Data Sheets are located in the Facility's Safety Office. Identify the location of the Facility's Safety Office.

96. Describe how the Facility will determine that an anhydrous ammonia release at the Facility qualifies as "a controlled or incidental release." Provide examples of "controlled or incidental releases," describe how frequently they occur, identify who would respond to those releases, and describe how the Facility will determine that these releases can be safely addressed.

97. Section 1.4 of the ERP describes safe distances and places of refuge and refers to a Site Map defined as "Appendix A-1." Provide a copy of Appendix A-1.

98. Identify the Plant Security Manager mentioned in Section 1.5.1 of the ERP.

99. Identify and describe the portion of the Facility mentioned as the "entire Refrigeration Department" in Section 1.5.2 of the ERP.

100. Define the ERP's use of the following terms: Exclusion Zone; Reduction Zone; and the Support Zone. Identify these zones on a map of the Facility. Describe how these zones were determined.

101. According to Section 1.6.2 of the ERP, Section 1.6.2 "in conjunction with section 3 of this plan will constitute the emergency procedures for all HAZMAT emergency responders." Provide a copy of Section 3 of the ERP and the Facility's ammonia release plan.

102. Section 1.6.2.d of the ERP mentions alternate evacuation routes. Describe how alternate evacuation routes will be designated under the ERP.

103. According to Section 1.7.2 of the ERP (Decontamination—Emergency Procedures), "In the event of [personal protection equipment] failure, retire to the contamination reduction zone as soon as possible. For eye contact, use the eye wash station; for skin contact use the deluge shower after doffing the level B protection." Identify the location of the Contaminant Reduction Zone. Identify any eyewash stations or showers in this area of the Facility.

104. Provide copies of all of the written critiques of HAZMAT team's practice and training drills for the last three years, as described in Section 1.10.1 of the ERP.

105. According to Section 1.10.2 of the ERP, all HAZMAT incidents must be critiqued in writing. Provide copies of all written critiques of actual HAZMAT incidents at the Facility for the last

three years, including any written critique for the March 23, 2016 ammonia release at the Facility.

106. Describe how the level of personal protective equipment listed in Section 1.11.1 of the ERP was determined, including who made the determination and when the determination was made.

107. Describe the ERP's use of the following terminology in Section 1.11.1 and identify the personnel who hold these titles:

   i. Contaminated HAZMAT Team B/A Area.

   ii. Decontamination HAZMAT Team.

   iii. Area HAZMAT Team Members.

   iv. HAZMAT Paramedics.

   v. Support Area Incident Commander.

   vi. Safety Manager.

   vii. Operations Manager.

108. According to Section 1.11.4 of the ERP, Figure A-1 notes the location of all of the Facility's HAZMAT personal protective equipment, fire extinguishers, and fire hose/standpipes. Provide a copy of the ERP's Figure A-1.

109. Section 1.11 of the ERP describes the personal protective and emergency equipment at the Facility as including SCBA equipment on site. Provide information on any SCBA equipment the Facility has on site, including any inspection and maintenance records.

110. Section 1.11.3 of the ERP describes the limitations of the Facility's personal protective equipment and personnel. Describe the means, measurement tools, and acceptable limits for the measurements identified in Section 1.11.3 of the ERP.

Instructions: Complete and Include With Your Response.

DECLARATION

I declare under penalty of perjury that I am

the _____ of _____,
[Title] [Name of Facility]

that I am authorized to respond on behalf of
_____, and that the foregoing is a
[Name of Facility]

complete, true, and correct response.

Executed on _____ _____
[Date] [Signature]

_____
[Type Name and Title]